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COMPUTER APPLICATIONS FOR
TRANSIT PLANNING.

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CUTA TRANSIT PLANNING TRAINING PROGRAM
MAY 29TH TO JUNE 3RD, 1988
ORILLIA, ONTARIO

URBAN MUNICIPAL
JAN 9 1991
GOVERNMENT DOCUMENTS

COMPUTER APPLICATIONS FOR TRANSIT PLANNING

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JUNE 2, 1988

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1. PURPOSE

Due to limited time and the large amount of detailed information on this topic, the purpose of this presentation is to give course participants a broad exposure to different types of computer applications used by transit properties as part of the transit planning function.

2. BACKGROUND

Early applications of computers in public transit:

- Accounting & Payroll systems (1960s)
- Transportation Planning Modelling (1960s)
- Origin-Destination Surveys (1960s)
- Cordon Counts (1960s)
- Scheduling and Runcutting (RUCUS 1968 +)
- Tabulation of Manual On/Off Counts and Point Counts (Early 1970s)
- Preventative Maintenance & Scheduling systems (early 1970s)
- Automatic Passenger Counters (mid-1970s)
- Automated Vehicle Location & Control Systems (mid-1970s)
- Automatic Telephone Information Systems (late 1970s)
- Purchasing & Materials Management (early 1980s)
- Automated Fare Collection Systems (early - mid 1980s)
- Trip Planning (early 1980s)
- Rostering (early 1980s)
- Operator Bidding & Time Keeping (mid-1980s)
- Spreadsheet applications (early 1980s with advent of PCs)

3. DEFINITION OF "AUTOMATION"

The Concise Oxford Dictionary (1985) defines "automation" as the "use of automatic equipment to save mental and manual labour."

Most concepts that have been used for decades in transit planning have not really changed. It is just that there are now time and labour saving tools (i.e. microprocessors and software) that make the job faster and easier. Examples of old concepts in transit planning that haven't really changed are:

- Scheduling & Runcutting
- Passenger Counting
- Route Costing & Budgeting
- Origin-Destination Surveys

Computer applications have greatly assisted in reducing the time cycle of the transit planning process. As shown in Figure 1, depending on the scope of the project (e.g. major route re-structuring), the transit planning process consumes a large amount of time mainly due to all the different interrelationships associated with the provision of transit service.

4. GENERAL BENEFITS OF COMPUTERIZING

- Improved productivity
- Improved speed and accuracy
- Greater opportunities to reduce costs and improve efficiency
- Reduction of errors
- Better information for decision making
- Quicker response time to "What if" requests
- Computer forces one to be consistent
- Easy method of storing & accessing historical information

5. SCHEDULING & RUNCUTTING

Out of the entire transit operation, the greatest benefits that can be achieved are in the scheduling and runcutting function, which is the core of public transit. This is where tremendous cost savings can be made through the efficient use of vehicles and manpower and where computerization has the greatest impact.

5.1 Definition

Before pointing out the benefits of computerized scheduling and runcutting, what exactly is it?

- A series of complicated mathematical equations which attempt to provide optimal solutions to vehicle requirements, headways and manpower requirements for a given level of service.

- Flexibility is required to override optimal mathematical solutions in order to properly reflect reality. This was a problem with the earlier versions, such as RUCUS.

- Computerized scheduling actually means computer assisted scheduling, which is interactive:

- The user enters all data using a keyboard and video display terminal

- The user directs all schedule development in real-time

- The computer prompts the user for responses and flags errors

- The experience and skill of the scheduler is needed to develop a realistic, yet optimal solution.

The computer program handles all the tedious and routine tasks of scheduling, while permitting the scheduler to concentrate on analysis and production of better schedules and runcuts, for example:

- Improved connections and transfer points

- Reduced layovers

- Reduced deadheading

- More productive driver assignments

- Reduced overtime

5.2 Benefits of Computerized Scheduling & Runcutting:

- Improved speed and accuracy in producing schedules and driver runcuts.

- Permits scheduler to devote more time to experimenting with various parameters to improve efficiency, schedule adherence and reduce costs.

- From small to large size transit properties, there can be anywhere from 5,000 to 250,000 schedule times listed on a headway sheets for all routes. If schedules change every 3 or 4 months (and much more often in the larger properties) the probability of error increases dramatically under a manual system, when times are transposed from one report format to another. With computerized scheduling, the computer automatically generates reports and flags errors, permitting the scheduler to make fast and easy changes.

- Establishes a central and consistent database, permitting frequent modification and eliminates the duplication of scheduler's work from sign-up to sign-up.

- Automatically generates management reports when changes are made to any aspect of the database. When one data item is changed, everything is modified accordingly.

- Permits transit property to interline routes more effectively resulting in potential manpower and vehicle savings. In the HSR's case, there was a reduction from 42 vehicles to 29 vehicles in the peak on one route that was interlined in March 1987. To achieve this, the headway was increased by one minute, from a 5 minute headway to a 6 minute headway.

- Allows the planner to respond and cost out more quickly, service requests received from senior management, politicians and the public.

- Permits quicker response time to demands made during collective bargaining.

Sample Reports available from a scheduling & runcutting package are shown in Figure's 1.1 to 1.11.

5.3 Problems Encountered When Converting To A Computerized Scheduling & Runcutting System:

- Modifications to the program may be required in order to conform to individual property's reporting, sign-up and dispatching methods.

- Adopting to the accuracy of the computer will result in manual errors that have been overlooked or ignored under the manual system, will be detected by the computer, resulting in changes to driver and vehicle runcuts.

- Learning and adapting to the scheduling package and the computer by staff.

- Difficulty in remembering computer program commands.

- Difficulties in transit staff communicating program changes to the technical "computer experts" who devised the program.

- Lack of acceptance and understanding by drivers (this can be overcome as described later in this presentation).

- Phasing in the computer system, while at the same time continuing with day-to-day tasks.

5.4 Integration With Other Applications

Computer scheduling packages are often integrated with other computer software applications.

The schedule database produced by a scheduling package can be integrated with Automatic Passenger Counting (APC) system, automatic telephone information system, operator timekeeping and bidding system, automated payroll systems, etc. Figure 2 shows how the scheduling system forms the centre of all other computerized applications for Hamilton's transit system.

5.5 Tips

Before deciding to computerize the scheduling and runcutting function, consider the following:

- List and examine the potential benefits obtained through computerization in comparison to existing manual methods.

- Estimate how often you expect to utilize the software and hardware.

- Determine other future computer applications 1 to 3 years in advance, that may be implemented.

- Before purchasing a package, make sure training and on-going support is provided.

- Choose computer hardware that is also capable of running other applications (e.g. spreadsheets, graphics, database management). These will likely be required sooner than you may have originally thought once a computer is located on your premises.

- Establish a forum where drivers and union representatives can be kept informed of computerization, well before it is implemented. This will reduce suspicions and encourages cooperation. For example, a personalized letter to each drivers home explaining the system briefly or feature articles in the property's newsletter are proven effective ways of keeping employees informed.

- As computer scheduling is implemented, it is best to meet with selected drivers appointed to a special ad hoc committee or an existing "Sign-Up" committee, where sample reports that directly affect drivers (e.g. paddles, headway sheets, sign-up sheets, crew selection forms, etc.) can be explained on a gradual basis so that changes, if necessary, may be included rather than surprising operating personnel at the last minute.

- Have respect for "Murphy's Law"!

6. DATA COLLECTION AND MANIPULATION

Having up-to-date information on passenger loads is essential to operating an efficient transit operation. As a result, passenger counting is the most important variable of the scheduling and runcutting process.

Passenger counting can be achieved by either doing manual counts using traffic checkers or by implementing an automatic passenger counting system (APC).

The different types of surveys and methods were presented earlier in this course at another presentation and therefore, the focus here will be showing different examples of how manually collected data can be tabulated using different computer applications.

6.1 Manual Data Collection

Using off-the-shelf spreadsheet applications (e.g. Lotus 1-2-3, Multiplan, Enable, etc.) can be used to summarize on/off counts, speed-delay surveys, running-time surveys, schedule adherence, maximum load counts, transfer traces and many other types of survey data used for transit planning. Some examples from different properties are shown in Figures 3 to 5.

6.1.2 Problems

Several problems have been identified by transit properties on manual data collection techniques such as:

- Low accuracy

- Poor reliability

- High costs

- Long turnaround time between observation & reporting of events.

6.2 Automatic Passenger Counters (APCs)

To address the need for more reliable and cost efficient data collection methods, a number of transit properties in North America began to develop APCs in the mid-1970s. Today, there are about 20 properties in the U.S.A. and Canada that have implemented APCs.

Because there has been an extensive amount of literature on this subject (please refer to bibliography), this presentation will not get into the technical aspects of APCs, but rather focus on the benefits and applications of APCs.

6.2.1 APC Configuration

The general hardware and software configurations of APC systems currently used in Ottawa, Hamilton and Kitchener are shown in Figures 6 and 7. It should be noted that Ottawa uses infrared beams for counting passengers, while Hamilton and Kitchener use pressure sensitive treadle mats. In Ottawa, data is transmitted from buses to the host computer via radio signals. In Hamilton and Kitchener, data is transmitted via an umbilical cable.

6.2.2 APC Applications

There are several different types of reports and graphics that can be generated by an APC system for use by schedulers, transit planners, bus stop and shelter administrators and managers. The majority of reports are produced based on what the user requires. For example, the user may specify:

- A service type (e.g weekday, Saturday, Sunday or Holiday)
- A range of dates (e.g From date... To date...)
- A time period (e.g. From time... To time...)
- A route and direction
- A bus stop, timepoint, route section or geographical area.

There have been over one hundred different types of reports defined for the OC Transpo APC system, which are primarily based on different parameters and combinations of the following:

a) Reports For Scheduling & Transit Planning:

- Passenger loadings by timepoint or maximum load point
- Passenger boardings and alightings
- Schedule adherence (minutes late, early & on-time)
- Running and Recovery times
- Headway distribution

b) Reports For Measuring Performance

- Passengers per hour
- Passengers per kilometre
- Percent off schedule
- Revenue/Cost ratios
- Percent overloading
- Percent excessive recovery time

Sample reports are shown in Figures 8 to 13.

6.2.3 Benefits of APCs

APCs provide transit properties with a powerful tool for transit planning, operations and management. However, in order for an APC system to be effective, senior management must make a strong committment towards the provision of resources to maintain and utilize the system as well as ensuring cooperation from the operations, maintenance and planning departments of the property.

The major benefits of APCs are:

- Reduces the need for manual data collection.
- Autonomous and continuously available.
- Reduces on-going costs of data collection compared to manual.
- Quick turnaround time between observation and reporting.
- Provides access to large pool of data to assess current and future needs of the transit market.
- Provides on-going and ready access to passenger and operational data.

These benefits can be used to:

- Assist in locating and relocating bus stops and shelters.
- Devise alternative routing strategies.
- Determine how well schedules match on-road conditions.
- More accurately reflect actual arrival and departure times.
- Increase productivity by taking buses off low ridership routes.
- Provide management with indicators of the system and route performance.
- Establish and quantify marketing and policy strategies

6.3 Applications For Bus Stops and Shelters

A database management system for maintaining information on a transit system's bus stops and shelters is an effective tool for transit planning. It provides an efficient method of updating, archiving and generating reports on bus stop locations for use by the transit maintenance, public works, customer services, planning and traffic departments. Off-the-shelf PC based database management packages can be used for this purpose, while in the past, custom programs operating on large mainframe computers were used.

Information is acquired on the characteristics of each bus stop, such as: bus stop type (e.g. nearside, farside, mid-block), corner, traffic regulation signs, pole type, marker type and information displayed, condition of area, shelter size and type, benches, presence of overhead lighting, newspaper boxes, litter containers, etc. Figure 14 shows a sample field sheet used by student surveyors. Figure 15 shows a sample layout and measurement description of a typical bus stop location.

After the data is collected, it is entered into the database package using a screen format similar to the example shown in Figures 16 and 17.

6.3.1 Reports

Several different types of reports can be generated by the user, showing bus stop locations by route and direction with:

- Shelters
- On provincial, regional, local or private roads
- Distance to curb lines
- Type of marker
- Type of pole
- Ground conditions
- Historical info. on stop relocations or removals

The efficiency and power of having the data on the computer is proven when the user requires the information in different formats. For example, the data can be sorted by:

- Street location (e.g. "find all bus stops on Barton Street")
- Municipality (e.g. "find all stops in the Town of Dundas")
- Pole type (e.g. "find all stops mounted on Hydro poles")

Figure 18 and 19 shows the sample reports.

6.3.2 Integration With Other Applications

In addition to being used as a separate independent application, a computerized bus stop inventory program can also be used with other computerized transit applications. For example, bus stop "on street" and "at street" descriptions are interfaced electronically by APC systems in Ottawa, Hamilton and Kitchener.

6.3.3 Benefits

- Provides the transit property with an efficient method of keeping accurate up-to-date records of bus stop locations.

- Establishes a central and consistent database of information related to bus stops, shelters, traffic regulation signs, and associated street furniture.

- Allows transit planners and customer services staff to investigate and respond quickly to customer complaints concerning bus stop locations.

- Permits the transit property to automatically generate several various reports for use by different departments for such pruposes as snow removal at bus stops, maintenance of shelters, capital improvements to landing areas of stops, replacement of signs and glass from shelters due to vandalism, etc.

- Provides and easy method of storing and accessing historical information on the relocation, removal and initial establishment of bus stop locations.

- Assists the Traffic Dept. in the enforcement of traffic regulations and bylaws, which control usage and access to bus stops.

6.4 Spreadsheet Off-The-Shelf Applications

For route costing and budgeting, these same spreadsheet packages can be used and integrated with the graphics component of the package to make effective presentations to management and decision-makers. A number of off-the-spreadsheet packages have been used to address specific areas of transit planning such as, the ability to predict changes in ridership with fare increases, analyze route performance, develop statistical sampling plans for on/off surveys and point checks, etc. Figures 20 to 22 show some examples. For more detailed explanation on using off-the-shelf packages, please refer to the enclosed bibliography.

6.5 Project Planning Applications

For managing large projects, such as a major origin-destination survey, developing a new bus terminal or just keeping track of on-going projects, there are a number of off-the-shelf project planning applications that are available. Figures 23 to 25 are some examples of how a project planning package can be used.

6.6 Origin-Destination Survey Applications

Off-the-shelf packages can also be used to summarize data collected from on-board origin-destination surveys. O-D matrices can be developed by using the 'crosstabs' function of most descriptive statistics packages.

6.7 Graphics

The advances in microcomputer technology have brought excellent graphic applications within the range of nearly every PC user. Computer graphics can be generated from other off-the-shelf packages such as spreadsheets and database management systems, without adding much additional work. Graphics can be particularly effective when presenting ridership and cost information to management or elected representatives.

There are almost an infinite number of ways of presenting tabular data in graphical format. Some examples in the transit planning area are shown in Figures 26 to 29.

Desktop publishing, which is now available for most IBM PCs and compatibles, is an extremely useful tool for transit planners. The different lettering styles that are available with such (FIG. 30) systems can save hours of manual work when preparing displays for public information meetings or maps for technical reports. Timetables for public distribution can be made from data produced by the computerized scheduling system and printed onto a laser printer, thereby eliminating the need for typesetting (FIG. 31).

7. BRIEF OVERVIEW OF SOFTWARE & HARDWARE

There are thousands of off-the-shelf software packages for spreadsheet, database management, graphics and statistical applications. Many of these, can be used for different transit planning applications as outlined in this presentation. However, for scheduling and runcutting, APC and other specialized applications, there are only a few suppliers. The bibliography lists references where more descriptive information can be obtained on these specialized applications.

It is common knowledge that most applications operate on IBM PCs or compatibles, which in the larger properties are networked into larger mini or mainframe computers. In addition to PCs, several Ontario properties are using Digital Equipment Company (DEC) VAX minicomputers and microVAXs for scheduling and runcutting, APCs, preventative maintenance scheduling, inventory control, automatic telephone information, radio communications and many other applications. This is mainly a result of the efforts of the Ontario Ministry of Transportation & Communications, which since the early 1980s, has been instrumental in encouraging the development of computer applications, through attractive funding programs, for improving the performance of transit operations in Ontario. Most of the large applications were developed originally on VAX minicomputers.

8. NEW AND FUTURE APPLICATIONS

As far as transit planning is concerned, there are some new applications that are now in progress which will provide some of the information that is available from the current APC systems. Automated Vehicle Location and Control (AVLC) systems are capable of providing data related to scheduling on all routes for any given day or time. To avoid "data overload" from such systems, an "exception" reporting system, based on user-defined parameters, comprises an important part of AVLC.

Land related information systems (LRIS) or geographical information systems (GIS) are being developed in different municipalities across Canada for the purposes of assessment, survey records, mapping, elections, subdivision design, population forecasting, public works, transportation and several other areas of local government that require similar information. LRIS archives all the data associated with the latter functions into a relational database to later produce maps, engineering drawings, population forecasts, etc. in a consistent and readily available format for users from different departments.

Although this is a relatively new concept and is in the preliminary stages, there are potential uses of LRIS for transit planning, as outlined below:

- Up-to-date base maps available instantaneously with user specified scales.
- Up-to-date maps showing population and employment by city block, traffic zone, census tract, etc.
- Consistent map scales for all municipalities within a region.
- Integration of base maps from LRIS with ridership volumes collected by an APC system.
- Status of development reporting capabilities indicating type of development, building permits issued, occupied and unoccupied units.
- Location of bus stops and shelters and relationship encroachments, nearby utilities (hydro, phone, water & gas lines) and road allowance.
- Interfacing traffic volumes with base maps to assist in shelter locations.
- Generating up-to-date list of addresses for public attitude and transportation surveys.

Other new computer developments of interest to transit planners is in the area of CAD (Computer Aided Design) systems for map work (FIG. 32), transit modeling and maintaining large databases in graphical form instead of the current tabular form.

New computer languages, referred to as 4th and 5th generation languages, are also being developed which will assist computer users in analyzing data. These systems use common English expressions, rather than complicated computer jargon, to achieve data manipulative tasks.

The advances in computer applications will continue to assist transit planners in providing senior management with the best information possible for better decision making and improved services for the public transit customer.

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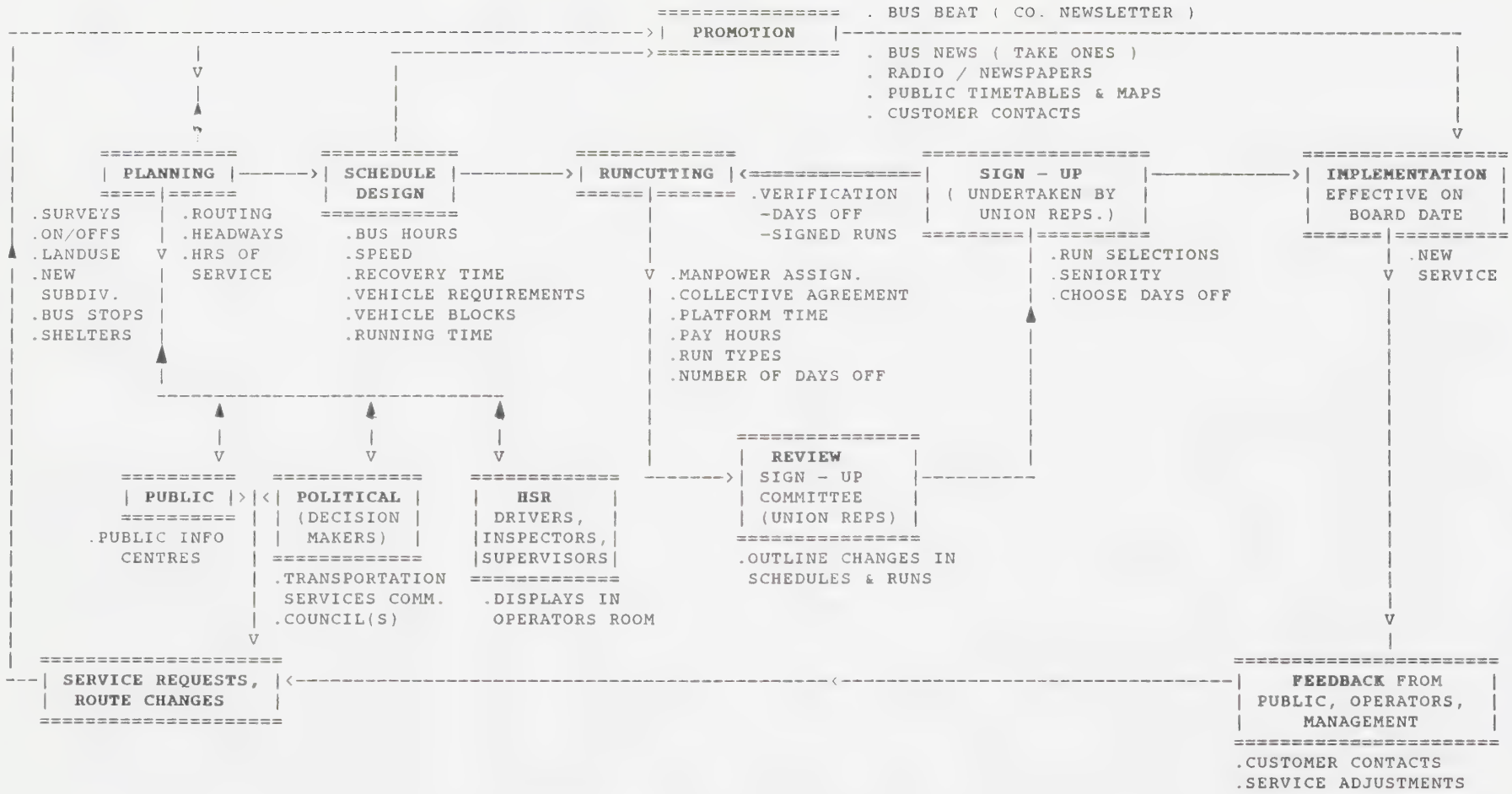
OVERVIEW OF
TRANSIT PLANNING PROCESS
AT THE
HAMILTON STREET RAILWAY CO.



HSR VCM 21SEP87

FIG. 1

FIG. 1.1

27 — WEEKDAY
OUTBOUND

HAMILTON STREET RAILWAY SCHEDULE

PAGE: 1
EFF-DATE: 06SEP87
REV-DATE:

UPPER JAMES

TIME: 5:25 AM

RUN-X DAY-X	RTE. NO.	BLOCK NO.	NOTE	GAR-OUT FR-LINE	D-H	STOP ARR	GORE PARK	CONC UPWL	UPJA FENL	UPJA MOHK	UPJA LIME	GRTH LOOP	CITY LITS	MTGA SOUT	MTGA SOUT	STOP LVE	D-H	GAR-IN TO-LINE
	27B	1				5:23	5:25	5:33	5:37	5:42	5:45		5:52	5:54	5:55	6:11		
	27A	2				5:33	5:35	5:43	5:47	5:52	5:55	6:01				6:05		
	27B	3				5:43	5:45	5:53	5:57	6:02	6:05		6:12	6:14	6:15	6:31		
	27A	4				5:53	5:55	6:03	6:07	6:12	6:15	6:21				6:25		
	27B	5				6:03	6:05	6:13	6:17	6:22	6:25		6:32	6:34	6:35	6:51		
	27A	6				6:13	6:15	6:23	6:27	6:32	6:35	6:41				6:45		
	27B	7				6:23	6:25	6:33	6:37	6:42	6:45		6:52	6:54	6:55	7:11		
	27A	2				6:33	6:35	6:43	6:47	6:52	6:55	7:01				7:05		
	27B	1				6:43	6:45	6:53	6:57	7:02	7:05		7:12	7:14	7:15	7:31		
	27A	4				6:53	6:55	7:03	7:07	7:12	7:15	7:21				7:25		
	27B	3				7:03	7:05	7:13	7:17	7:22	7:25		7:32	7:34	7:35	7:51		
	27A	6				7:13	7:15	7:23	7:27	7:32	7:35	7:41				7:45		
	27B	5				7:23	7:25	7:33	7:37	7:42	7:45		7:52	7:54	7:55	8:11		
	27A	2				7:33	7:35	7:43	7:47	7:52	7:55	8:01				8:05		
	27B	7				7:43	7:45	7:53	7:57	8:02	8:05		8:12	8:14	8:15	8:31		
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	27A	6				8:13	8:15	8:23	8:27	8:32	8:35	8:41				8:45		
	27B	3				8:23	8:25	8:33	8:37	8:42	8:45		8:52	8:54	8:55	8:56		
	27A	2				8:33	8:35	8:43	8:47	8:52	8:55	9:01				9:15		
	27B	5				8:43	8:45	8:53	8:57	9:02	9:05		9:12	9:14	9:15	9:26		
	27A	4				8:53	8:55	9:03	9:07	9:12	9:15	9:21				9:21	#	MO-9:31
	27B	7				9:03	9:05	9:13	9:17	9:22	9:25		9:32	9:34	9:35	9:56		
	27A	6				9:13	9:15	9:23	9:27	9:32	9:35	9:41				9:46		
	27B	3				9:28	9:30	9:38	9:42	9:47	9:50		9:57	9:59	1000	1027		
	27A	2				9:43	9:45	9:53	9:57	1002	1005	1011				1016		
	27B	5				9:58	1000	1008	1012	1017	1020		1027	1029	1030	1057		
	27A	6				1013	1015	1023	1027	1032	1035	1041				1046		
	27B	7				1028	1030	1038	1042	1047	1050		1057	1059	1100	1127		
	27A	2				1043	1045	1053	1057	1102	1105	1111				1116		
	27B	3				1058	1100	1108	1112	1117	1120		1127	1129	1130	1157		

FIG. 1-2

KEY - 2 —— UP/JAMES WEEKDAY EFFECTIVE: 28JUN87

RUNS 2701 — 2710 — 8051 — ——— — ——— — ——— — ——— PAGE: 1

27 << INBOUND ++ — UP/JAMES— ++ OUTBOUND >>

RTE	NOTE	GORE PARK	CONC UPWL	UPJA FENL	UPJA MOHK	UPJA LIME	GRTH LOOP	CITY LITS	MTGA SOUT	MTGA SOUT	
P-O	— LEAVE 455 AM FROM MONT GAR — ARRIVE 505 AM AT GRTH-LOOP —										
27A	<<	533	525	517	514	511	505	——	——		++
27A	++	535	543	547	552	555	601	——	——	——	>>
27A	<<	633	625	617	614	611	605	——	——		++
27A	++	635	643	647	652	655	701	——	——	——	>>
27A	<<	733	725	717	714	711	705	——	——		++
27A	++	735	743	747	752	755	801	——	——	——	>>
27A	<<	833	825	817	814	811	805	——	——		++
27A	++	835	843	847	852	855	901	——	——	——	>>
27A	<<	943	935	927	924	921	915	——	——		++
27A	++	945	953	957	1002	1005	1011	——	——	——	>>
27A	<<	1043	1035	1029	1026	1022	1016	——	——		++
27A	++	1045	1053	1057	1102	1105	1111	——	——	——	>>
27A	<<	1143	1135	1129	1126	1122	1116	——	——		++
27A	++	1145	1153	1157	1202	1205	1211	——	——	——	>>
27A	<<	1243	1235	1229	1226	1222	1216	——	——		++
27A	++	1245	1253	(1257)	102	105	111	——	——	——	>>
27A	<<	143	135	129	126	122	116	——	——		++
27B	++	145	153	157	202	205	——	212	214	215	>>
27B	<<	303	255	249	246	242	——	235	232		++
27A	++	305	313	317	322	325	331	——	——	——	>>
27A	<<	403	355	349	346	342	336	——	——		++
27A	++	405	414	420	424	427	433	——	——	——	>>
27A	<<	503	455	(449)	446	442	436	——	——		++
27A	++	505	514	520	524	527	533	——	——	——	>>
27A	<<	603	555	549	546	542	536	——	——		++
27A	++	605	613	617	620	623	629	——	——	——	>>
27A	<<	708	700	655	652	649	643	——	——		++
P-I	— LEAVE 708 PM FROM GORE-PARK — ARRIVE 724 PM AT MONT GAR —										

FIG. 1·3

HAMILTON STREET RAILWAY TIMEPOINT REPORT

FROM-NODE —— INT #: 5302 EXT #: 5302 BRIEF: JALI ABRREV: UPJALIME EXTENDED: UPPER JAMES & LIMERIDGE

TO—NODE —— INT #: 0 EXT #: 0 BRIEF: ABRREV: EXTENDED:

LINE	ROUTE	DIRECTION	KEY	LEAVE	ARRIVE	RUN-X	DAY-X
27	27B	INBOUND	- 1	5:01A			
27	27A	INBOUND	- 2	5:11A			
27	27B	INBOUND	- 3	5:21A			
27	27A	INBOUND	- 4	5:31A			
27	27B	INBOUND	- 5	5:41A			
27	27B	OUTBOUND	- 1	5:45A			
27	27A	INBOUND	- 6	5:51A			
27	27A	OUTBOUND	- 2	5:55A			
27	27B	INBOUND	- 7	6:01A			
27	27B	OUTBOUND	- 3	6:05A			
27	27A	INBOUND	- 2	6:11A			
27	27A	OUTBOUND	- 4	6:15A			
27	27B	INBOUND	- 1	6:21A			
27	27B	OUTBOUND	- 5	6:25A			
27	27A	INBOUND	- 4	6:31A			
27	27A	OUTBOUND	- 6	6:35A			
27	27B	INBOUND	- 3	6:41A			
27	27B	OUTBOUND	- 7	6:45A			
27	27A	INBOUND	- 6	6:51A			
[illegible]	27A	OUTBOUND	- 2	6:55A			
[illegible]	27B	INBOUND	- 5	7:01A			
27	27B	OUTBOUND	- 1	7:05A			
27	27A	INBOUND	- 2	7:11A			
27	27A	OUTBOUND	- 4	7:15A			
27	27B	INBOUND	- 7	7:21A			
27	27B	OUTBOUND	- 3	7:25A			
27	27A	INBOUND	- 4	7:31A			
27	27A	OUTBOUND	- 6	7:35A			
27	27B	INBOUND	- 1	7:41A			
27	27B	OUTBOUND	- 5	7:45A			
27	27A	INBOUND	- 6	7:51A			
27	27A	OUTBOUND	- 2	7:55A			
27	27B	INBOUND	- 3	8:01A			
27	27B	OUTBOUND	- 7	8:05A			
27	27A	INBOUND	- 2	8:11A			
27	27A	OUTBOUND	- 4	8:15A			
27	27B	INBOUND	- 5	8:21A			
27	27B	OUTBOUND	- 1	8:25A			
27	27A	INBOUND	- 4	8:31A			
27	27A	OUTBOUND	- 6	8:35A			
27	27B	INBOUND	- 7	8:41A			
27	27B	OUTBOUND	- 3	8:45A			
27	27A	INBOUND	- 6	8:51A			
27	27A	OUTBOUND	- 2	8:55A			
27	27B	OUTBOUND	- 5	9:05A			
27	27B	INBOUND	- 3	9:06A			
[illegible]	27A	OUTBOUND	- 4	9:15A			
[illegible]	27A	INBOUND	- 2	9:21A			
27	27B	OUTBOUND	- 7	9:25A			

FIG. 1-4

HAMILTON STREET RAILWAY CO.
SCHEDULE DETAIL SHEET

SERVICE: 1 EFFECTIVE DATE: 28JUN87

ROUTE	SCH NO	SCHEDULED HOURS REV	RECV	DHD	PLAT	SCHEDULED MILES REV	DHD	TOTAL
UP/JAMES	187	89:50	17:13	1:32	108:35	1181.50	34.20	1215.70
SUB.TOT. BUSES		89:50	17:13	1:32	108:35	1181.50	34.20	1215.70
SYSTEM TOTAL		89:50	17:13	1:32	108:35	1181.50	34.20	1215.70

NOTES

HAMILTON STREET RAILWAY CO.
SCHEDULE ANALYSIS REPORT

SERVICE: 1 EFFECTIVE DATE: 28JUN87

ROUTE	SCHED #	VEH. TYPE	KEYS IN SERVICE AM RUSH	BASE	PM RUSH	EVENING	NIGHT	SCHEDULED HOURS REV	RECV	DHD	PLAT	SCHEDULED MILES REV	DHD	TOTAL	SCHEDULED MPH REV	DHD	PLAT
UP/JAMES	187		7	5	7	4	3	89:50	17:13	1:32	108:35	1182	34	1216	13.16	22.17	11.20
SUBTOTAL BUSES			7	5	7	4	3	89:50	17:13	1:32	108:35	1182	34	1216	13.16	22.17	11.20
SYSTEM TOTAL			7	5	7	4	3	89:50	17:13	1:32	108:35	1182	34	1216	13.16	22.17	11.20

FIG. 1.5

HAMILTON STREET RAILWAY CO.
SCHEDULE ANALYSIS REPORT

SERVICE: 1

EFFECTIVE DATE: Sept. '87

ROUTE	SCHED #	VEH. TYPE	KEYS IN SERVICE AM RUSH	BASE	PM RUSH	EVEN ING	NGHT	SCHEDULED HOURS REV	RECV	DHD	PLAT	SCHEDULED MILES REV	DHD	TOTAL	SCHEDULED MPH REV	DHD	PLAT
ABER	287		3	3	4	2	1	39:21	8:38	1:51	49:50	470	23	493	11.94	12.43	9.89
BARTON	284		17	15	22	12	4	256:28	22:18	2:09	280:55	2719	26	2745	10.60	12.09	9.77
BAYFRONT	186		7	6	7	3	3	83:45	19:26	3:31	106:42	1050	57	1107	12.54	16.21	10.37
BEELINE	187		7	7	7	1	0	46:46	5:16	8:05	60:07	747	130	877	15.97	16.08	14.59
BURL	185		4	2	4	3	1	41:09	9:52	1:42	52:43	592	36	628	14.39	21.18	11.91
CANNON	187		5	3	6	3	2	66:27	8:55	:31	75:53	716	4	720	10.78	7.74	9.49
COLLEGE	187		3	1	2	1	0	14:41	5:18	1:24	21:23	172	35	207	11.71	25.00	9.68
DELAWARE	187		25	22	23	17	9	303:34	42:37	16:02	362:13	3846	341	4187	12.67	21.27	11.56
DUN LOC	287		1	0	1	0	0	4:30	:44	1:28	6:42	55	24	79	12.22	16.36	11.79
FENNELL	187		8	6	9	7	5	112:06	18:47	3:57	134:50	1681	98	1779	15.00	24.81	13.19
GARTH	187		4	2	4	2	2	46:30	7:17	3:01	56:48	571	67	638	12.28	22.21	11.23
KING	187		14	14	15	9	4	208:51	20:38	1:25	230:54	2242	9	2251	10.73	6.35	9.75
LIM	187		3	3	3	1	0	28:30	9:18	1:00	38:48	355	22	377	12.46	22.00	9.72
LOCKE	187		2	2	3	2	1	28:39	11:03	1:32	41:14	277	21	298	9.67	13.70	7.23
MOHAWK	187		4	4	4	3	3	54:56	7:28	2:19	64:43	737	58	795	13.42	25.04	12.28
NASH	186		3	2	4	2	2	38:36	7:17	3:48	49:41	437	58	495	11.32	15.26	9.96
PARKDALE	187		7	5	7	4	3	82:19	9:31	6:06	97:56	1092	132	1224	13.27	21.64	12.50
SAN/ANC	184		5	2	5	2	2	55:32	4:40	4:13	64:25	724	102	826	13.04	24.19	12.82
SC CENT	287		3	3	3	3	0	35:08	6:59	2:21	44:28	504	62	566	14.35	26.38	12.73
SC LOCAL	184		1	1	1	1	0	8:24	3:25	:50	12:39	117	21	138	13.93	25.20	10.91
SHER/OTT	186		3	0	3	0	0	19:00	3:48	1:12	24:00	210	19	229	11.05	15.83	9.54
UNIV/ANC	286		5	5	6	2	0	50:19	7:25	2:34	60:18	632	24	656	12.56	9.35	10.88
UP/GAGE	187		6	3	6	3	3	70:00	9:25	5:58	85:23	966	123	1089	13.80	20.61	12.75
UP/JAMES	187		7	5	7	5	3	89:50	17:13	1:32	108:35	1182	34	1216	13.16	22.17	11.20
UP/KEN	187		5	3	6	2	2	60:22	7:17	4:19	71:58	806	96	902	13.35	22.24	12.53
UP/OTT	187		5	5	5	5	2	68:46	5:59	2:40	77:25	911	65	976	13.25	24.38	12.61
UP/PAR	187		4	3	4	2	2	48:44	5:48	1:49	56:21	628	47	675	12.89	25.87	11.98
UP/SHER	187		5	3	5	3	2	62:54	7:03	2:08	72:05	811	53	864	12.89	24.84	11.99
UP/WELL	185		4	3	4	3	2	44:00	15:06	1:07	60:13	548	26	574	12.45	23.28	9.53
UP/WENT	184		5	3	5	2	2	58:08	6:23	1:50	66:21	725	46	771	12.47	25.09	11.62
YORK	185		2	2	2	1	1	23:43	8:36	1:04	33:43	217	13	230	9.15	12.19	6.89
SUBTOTAL BUSES			177	138	187	106	61	2151:58	323:30	93:28	2568:56	26740	1872	28612	12.43	20.03	11.14
SYSTEM TOTAL			177	138	187	106	61	2151:58	323:30	93:28	2568:56	26740	1872	28612	12.43	20.03	11.14
SUBTOTAL			0	0	0	0	0	:00	:00	:00	:00	0	0	0	0.00	0.00	0.00

FIG. 1·6

HAMILTON STREET RAILWAY CO.
REVENUE ROUTE MILES BY JURISDICTION REPORT

LINE: UPPER JAMES
EFF DATE:
SERVICE: WEEKDAY

JURISDICTION	IB03	IB01	IB02	OB03	OB04	OB01	OB02	TOTAL
HAMILTON	285.0		249.1	256.5	17.1		253.8	1061.5
ANCASTER								
BURLINGTON								
DUNDAS								
GLANBROOK	45.0			72.0	3.0			120.0
STONEY CREEK								
TOTAL	330.0		249.1	328.5	20.1		253.8	1181.5

FIG. 107

HAMILTON STREET RAILWAY CO.

RUNNING TIMES REPORT

LINE: UPPER JAMES
SERVICE: WEEKDAY
DIRECTION: OUTBOUND
ROUTE: OB03
EFF DATE:

TIME POINTS	G	H	J	X	Y
	520A	335P	545P	620P	920P
	335P	545P	620P	920P	110X
GORE PARK					
CONCESSION & UPPER WELLINGTON	8	9	7	8	7
UPPER JAMES & FENNELL	4	6	4	4	4
UPPER JAMES & MOHAWK	5	4	3	3	3
UPPER JAMES & LIMERIDGE	3	3	3	3	3
CITY LIMITS	7	7	7	7	7
MOUNTAIN GARAGE SOUTH	2	2	2	2	2
MOUNTAIN GARAGE SOUTH	1	1	1	1	1
TOTAL RUNNING TIME	30	32	27	28	27

MINI-SCHEDULER II DOCUMENT : BSUMMARY SIZE : 9 23 DATABASE : SE87
RGRP 27 LINE 27 SER 1 REFN USER SYSTEM

01 ROW	02 LINE	04 BLK ID	05 BLK LGTH	06 NUM TRIP	07 OUT GAR	08 OUT TIME	09 FROM RTE	10 FROM NODE	11 FROM TIME	12 TO TIME	13 TO NODE	14 TO RTE	15 IN TIME	16 IN GAR	17 REV MILE	18 DHD MILE	19 TOT MILE	20 REV TIME	21 LOV TIME	22 DHD TIME	23 TOT TIME
1	27	1	3h44	6	8888	451A	IB03	MGS0	451A	835A	MGS0	OB03	835A	8888	41.7		41.7	3h06	h38		3h44
2	27	2	14h03	27	8888	455A	IB02	GALP	505A	708P	GOFK	IB02	724P	8888	147.6	9.9	157.5	12h09	1h54	h26	14h29
3	27	3	13h28	21	8888	511A	IB03	MGS0	511A	639P	GOFK	IB03	655P	8888	142.4	6.3	148.7	10h41	2h47	h16	13h44
4	27	4	3h56	8	8888	515A	IB02	GALP	525A	921A	GALP	OB02	931A	8888	42.8	7.2	50.0	3h36	h20	h20	4h16
5	27	5	20h12	36	8888	531A	IB03	MGS0	531A	143X	GALP	OB02	153X	8888	219.5	3.6	223.1	16h31	3h41	h10	20h22
6	27	6	16h55	32	8888	535A	IB02	GALP	545A	1040P	MGS0	OB04	1040P	8888	194.9	3.6	198.5	14h51	2h04	h10	17h05
7	27	7	19h12	34	8888	551A	IB03	MGS0	551A	103X	GALP	OB02	113X	8888	218.4	3.6	222.0	16h01	3h11	h10	19h22
8	27	8	4h49	8	8888	1257P	IB03	MGS0	1257P	546P	MGS0	OB04	546P	8888	51.8		51.8	3h59	h50		4h49
9	27	9	10h44	20	8888	242P	IB03	MGS0	242P	126X	MGS0	OB04	126X	8888	122.4		122.4	8h56	1h48		10h44

HAMILTON
STREET
RAILWAY

FIG. 1·8

Number of Day Straights	2	Total Report/Clear	3:00
Number of Day Splits	0	Total Spread Allow.	3:46
Number of Night Straights	4	Total O/T Allow.	0:09
Number of Night Splits	0	Total Paid Travel	0:49
Number of Day >10:00 Spread	6	Total Makeup	0:00
Number of Night >10:00 Spread	0		
		Total Allow.	7:44
Total Number of Straights	6	Total Platform	108:35
Total Number of Splits	0		
Total Number >10:00 Spread	6	Total Time	116:19
Total Number of Day Runs	8		
Total Number of Night Runs	4	Total Time/Plat. Ratio	107.12%
Total Number of Runs	12	Average Spread	9:54

Total Number of Unassigned Pieces 3

Run	Rte	Key	D	On	Off	Plat	Sprd	All	Trv	Pay
1	27	5	I	GOPK 523P	153A MONT	830	8:30	0:10		840
2	27	6	I	WLON 205P	1040P MONT	835	8:35	0:10		848
3	27	7	I	GOPK 443P	113A MONT	830	8:30	0:10		840
4	27	9	O	FELU 453P	126A MONT	833	8:33	0:10		845
5	27	2		MONT 455A	129P FELU	834	8:34	0:10		846
6	27	3		MONT 511A	144P FELU	833	8:33	0:10		845
7	27	5		MONT 531A	1142A FELU	611				
	27	9		MONT 242P	453P FELU	211	11:22	0:20	0:13	936
8	27	6		MONT 535A	915A GOPK	340				
	27	8		MONT 1257P	546P MONT	449	12:11	0:30	0:23	1028
9	27	7		MONT 551A	831A MGSO	240				
	27	5	O	FELU 1142A	523P GOPK	541	11:32	0:10	0:13	930
10	27	7	I	MGSO 831A	1150A WLON	319				
	27	3	I	FELU 144P	655P MONT	511	10:24	0:10		852
11	27	6	O	GOPK 915A	1127A FELU	212				
	27	2	I	FELU 129P	724P MONT	555	10:09	0:10		822
12	27	1		MONT 451A	657A FELU	206				
	27	7	I	WLON 1150A	443P GOPK	453	11:52	0:10		805
13	27	1	O	FELU 657A	835A MONT	138		0:10		148
14	27	4		MONT 515A	931A MONT	416		0:20		436
15	27	6	O	FELU 1127A	205P WLON	238				238

FIG. 1·9

HAMILTON STREET RAILWAY

ROUTE NAME: UPPER JAMES ROUTE NO: 27 SER: WEEKDAYS

DATE 15SEP87
TIME 15:18:49

RUN NO.	ROUTE NO.	KEY NO.	D R	ON LOC.	TIME ON	TIME OFF	OFF LOC.	PLATFORM TIME	PULL IN/OUT	ELAPSED TIME	TRAVEL TIME	SPRD TIME	DAILY O.T.	MAKE UP	OTHER ALLOW	TOTAL TIME
DAY RUNS																
2701	27	2		MONT	4:55A	1:29P	FELU	8:34	0:10	8:34			0:02			8:46
2702	27	3		MONT	5:11A	1:44P	FELU	8:33	0:10	8:33			0:02			8:45
NIGHT RUNS																
2703	27	6	I	WLON	2:05P	10:40P	MONT	8:35	0:10	8:35			0:03			8:48
2704	27	7	I	GOPK	4:43P	1:13A	MONT	8:30	0:10	8:30						8:40
2705	27	9	O	FELU	4:53P	1:26A	MONT	8:33	0:10	8:33			0:02			8:45
2706	27	5	I	GOPK	5:23P	1:53A	MONT	8:30	0:10	8:30						8:40
DAY >10:00 SPREAD RUNS																
2707	27	1		MONT	4:51A	6:57A	FELU	2:06								
	27	7	I	WLON	11:50A	4:43P	GOPK	4:53	0:10	11:52		0:56				8:05
2708	27	5		MONT	5:31A	11:42A	FELU	6:11								
	27	9		MONT	2:42P	4:53P	FELU	2:11	0:20	11:22	0:13	0:41				9:36
2709	27	6		MONT	5:35A	9:15A	GOPK	3:40								
	27	8		MONT	12:57P	5:46P	MONT	4:49	0:30	12:11	0:23	1:06				10:28
2710	27	7		MONT	5:51A	8:31A	MGSO	2:40								
	27	5	O	FELU	11:42A	5:23P	GOPK	5:41	0:10	11:32	0:13	0:46				9:30
2711	27	7	I	MGSO	8:31A	11:50A	WLON	3:19								
	27	3	I	FELU	1:44P	6:55P	MONT	5:11	0:10	10:24		0:12				8:52

FIG. 1·10

HAMILTON
STREET
RAILWAY

SATURDAY BOARD - EFFECTIVE DATE SEPT 6, 1987 AFTER

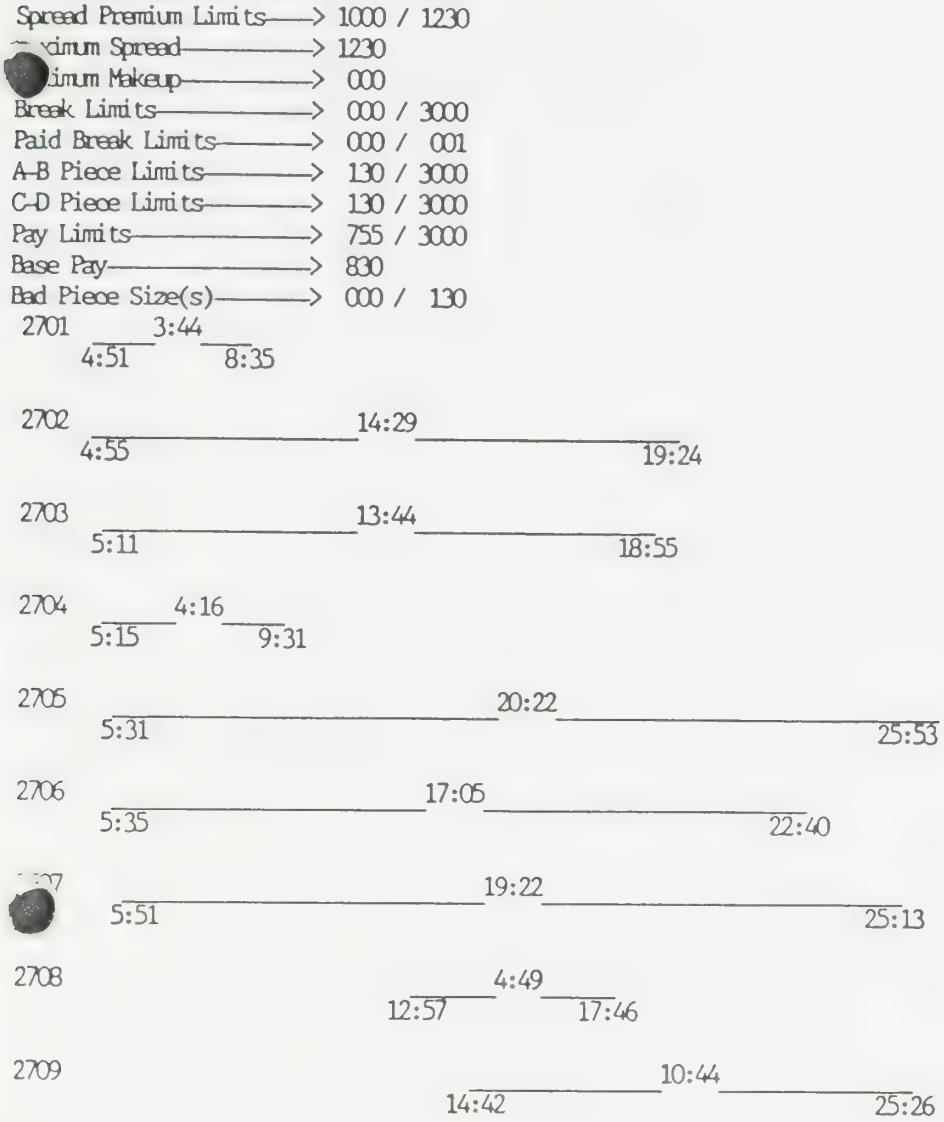
Number of Day Straights	81	Total Report/Clear	37:00
Number of Day Splits	27	Total Spread Allow.	0:00
Number of Night Straights	71	Total O/T Allow.	0:00
Number of Night Splits	1	Total Paid Travel	1:21
Number of Day >10:00 Spread	38	Total Makeup	0:01
Number of Night >10:00 Spread	0		
		Total Allow.	38:22
Total Number of Straights	152	Total Platform	1827:12
Total Number of Splits	28		
Total Number >10:00 Spread	38	Total Time	1865:34
Total Number of Day Runs	146		
Total Number of Night Runs	72	Total Time/Plat. Ratio	102.10%
Total Number of Runs	218	Average Spread	8:48

Total Number of Unassigned Pieces 17

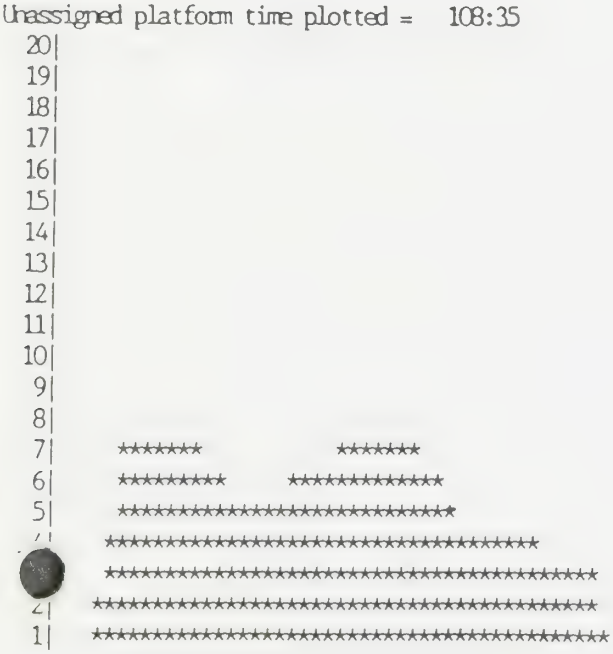
FIG. 1-11

Run Cutting Controls:

Before/After——————> 000 / 3000
One-Piece Platform——> 001 / 835
Two-Piece Platform——> 001 / 835
Spread Premium Limits——> 1000 / 1230
Maximum Spread——————> 1230
Minimum Makeup——————> 000
Break Limits——————> 000 / 3000
Paid Break Limits——> 000 / 001
A-B Piece Limits——> 130 / 3000
C-D Piece Limits——> 130 / 3000
Pay Limits——————> 755 / 3000
Base Pay——————> 830
Bad Piece Size(s)——> 000 / 130



Unassigned platform time plotted = 108:35



Maximum AMs = 7; Maximum PMs = 7; Platform = 108:35

MINISCHEDULER & RUNCUTTER

INTEGRATION WITH OTHER APPLICATIONS

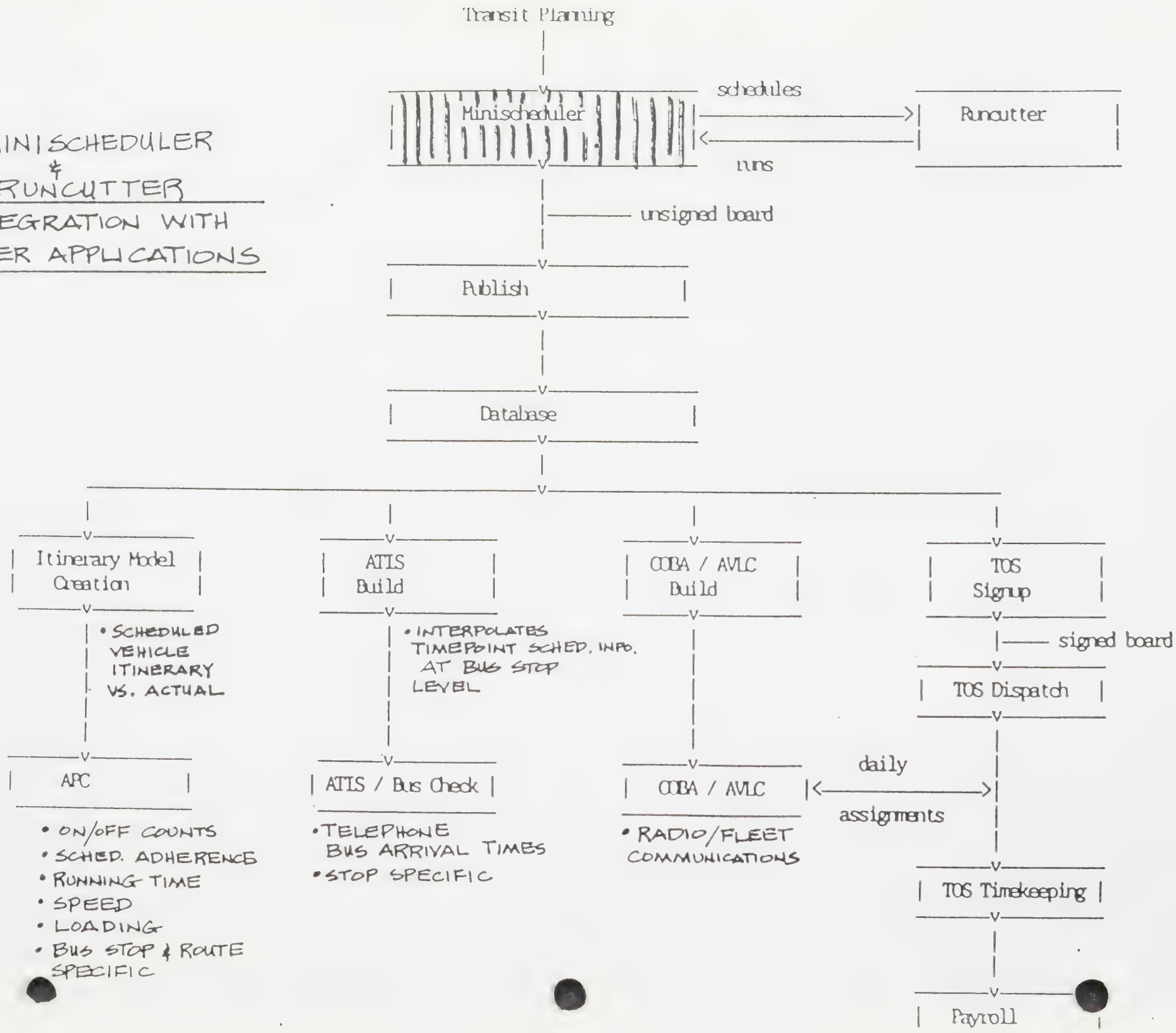


FIG. 2

FIG. 3

ROUTE 58 - Stoney Creek Local
ON/OFF Check
Thurs/Fri Evening Extras
Date: Thursday June 4, 1987

Depart EASTBOUND	655P ON	655P OFF	735P ON	735P OFF	815P ON	815P OFF	855P ON	855P OFF	935P ON	935P OFF	1015P ON	1015P OFF	1055P ON	1055P OFF	1135P ON	1135P OFF	1215A ON	1215A OFF	ON	OFF
EASTGATE	2	0	10	0	6	0	5	0	1	0	5	0	4	0	1	0	2	0	36	0
CENT@QSTN	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0
CENT@ #58	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0
CENT@PLSN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CENT@KING	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
KING@FAIR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
KING@BATT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
KING@WARD	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	3
KING@LAKE	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1
KING@MOUN	0	2	0	3	0	2	0	1	0	0	0	1	0	3	0	0	0	0	0	12
KING@NEWM	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	1	2
KING@LOMA	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
KING@BONI	0	0	0	1	0	3	0	2	0	0	0	0	0	0	0	0	0	0	0	6
KING@GRAY	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
KING@SBRK	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	4
KING@CORM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
KING@#256	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
KING@GREN	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2
KING@GFOR	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
KING@HWY8	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2
HWY8@KILB	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
WORS LOOP	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Total	2	2	13	13	6	6	6	6	3	3	5	5	4	4	1	1	2	2	42	42

Depart WESTBOUND	715P ON	715P OFF	755P ON	755P OFF	835P ON	835P OFF	915P ON	915P OFF	955P ON	955P OFF	1035P ON	1035P OFF	1115P ON	1115P OFF	1135P ON	1135P OFF	1230A ON	1230A OFF	TOTAL ON	TOTAL OFF
WORS LOOP	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
HWY8@KILB	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
KING@HWY8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
KING@GFOR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
KING@GREN	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	3	0
KING@#251	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
KING@CORM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
KING@SBRK	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	0
KING@GRAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
KING@DAWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
KING@MANR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
KING@JONE	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
KING@MOUN	1	0	1	0	1	0	1	0	0	0	1	0	1	0	0	0	1	0	7	0
KING@LAKE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
KING@VLGR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
KING@BATT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
KING@FAIR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CENT@KING	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CENT@RAND	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CENT@FELK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
QSTN@CENT	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
EASTGATE	0	4	0	4	0	1	0	1	0	3	0	1	0	0	0	0	0	2	0	16
Total	4	4	4	4	1	1	1	1	3	3	1	1	1	1	0	0	2	2	17	17

KITCHENER TRANSIT ROUTE TRAVEL TIMES AND SECTION SPEEDS

FEBRUARY 1985 ON-OFF SURVEY

Route #12 Direction I/B

Route Name UNIVERSITY/FAIRVIEW

From REGINA & UNIVERSITY To FAIRVIEW PARK MALL

Date FEB 27 & 28, 1985 Time Period OF

Weather COLD AND WINDY # 12

SECTION			RUN 1		RUN 2		RUN 3		RUN 1		RUN 2		MEAN TRAVEL TIME	MEAN SPEED
			915 HRS		948 HRS		1018 HRS		1048 HRS		1118 HRS			
FROM	TO	DIST. (km)	T (min)	S (kph)	T (min)	S (kph)	T (min)	S (kph)	T (min)	S (kph)	T (min)	S (kph)	(min.)	(kmh)
REGINA & UNIVERSITY	UNIVERSITY & HAZEL	.40	2.42	9.9	1.08	22.2	1.08	22.2	1.08	22.2	2.00	12.0	1.45	16.5
UNIVERSITY & HAZEL	UNIVERSITY & EXIT RD	1.70	2.92	35.0	3.25	31.4	2.92	35.0	3.58	28.5	2.50	40.8	3.15	32.4
UNIVERSITY & EXIT RD	FISCH-HAL & ERB	2.40	6.75	21.3	5.00	28.8	4.67	30.9	4.58	31.4	5.25	27.4	5.44	26.5
FISCH-HAL & ERB	FISCH-HAL & GLASGOW	1.50	3.25	27.7	2.25	40.0	1.08	83.1	1.83	49.1	2.25	40.0	2.31	38.9
FISCH-HAL & GLASGOW	FISCH-HAL & VICTORIA	1.30	1.83	42.5	1.42	55.1	2.50	31.2	2.00	39.0	1.17	66.9	2.07	37.7
FISCH-HAL & VICTORIA	WESTMOUNT & QUEEN'S	2.70	2.00	81.0	5.67	28.6	5.58	29.0	7.00	23.1	5.58	29.0	5.49	29.5
WESTMOUNT & QUEEN'S	WESTMOUNT & VILLAGE	.70	3.67	11.5	.83	50.4	1.25	33.6	.92	45.8	.75	56.0	1.25	33.6
WESTMOUNT & VILLAGE	WESTMOUNT & OTTAWA	1.00	1.67	36.0	1.25	48.0	1.50	40.0	2.25	26.7	1.17	51.4	1.76	34.0
WESTMOUNT & OTTAWA	DUNSMERE & LAUREN'H	1.30	1.42	55.1	1.42	55.1	2.42	32.3	2.50	31.2	2.33	33.4	2.37	32.8
DUNSMERE & LAUREN'H	BLOCK LN & STRASBURG	1.40	4.58	18.3	2.25	37.3	1.92	43.8	2.75	30.5	2.33	36.0	2.62	32.1
BLOCK LN & STRASBURG	BLEAMS & HOMER WAT	1.80	4.92	22.2	4.83	34.8	4.33	38.8	5.17	32.5	5.83	28.8	5.20	32.3
BLEAMS & HOMER WAT.	FAIRVIEW PARK MALL	3.30	5.75	34.4	5.25	37.7	4.50	44.0	6.42	30.9	8.25	24.0	5.87	33.7
TOTAL TRIP		20.5	41.17	29.9	34.50	35.7	33.75	36.4	40.08	30.7	39.42	31.2	38.99	31.5

T = travel time S = speed

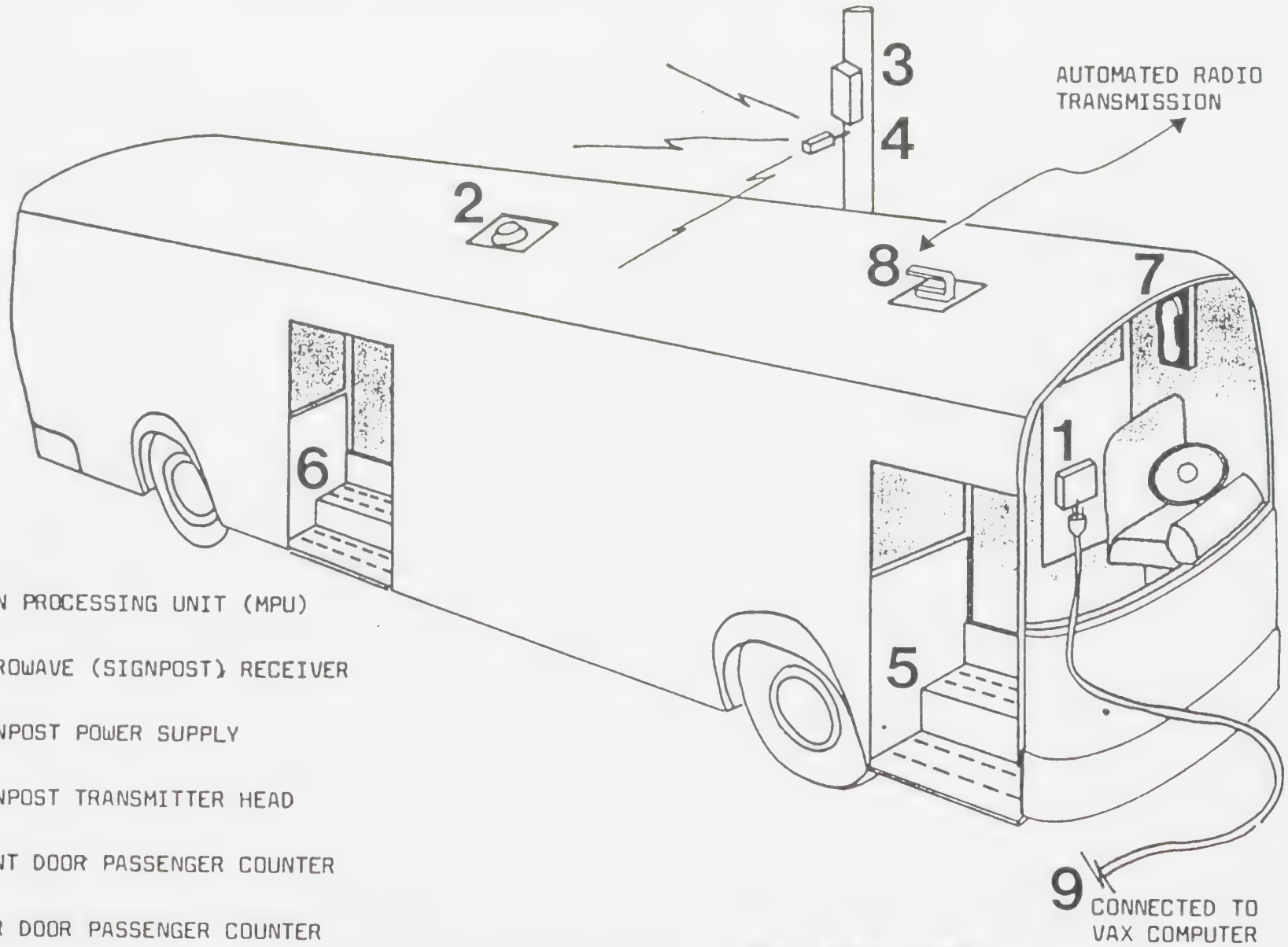
Additional Comments:

FIG. 4

KITCHENER TRANSIT TRANSFER PASSENGER CROSS-TABULATIONS
TRANSFER TRACE CONDUCTED TUESDAY MARCH 19 THROUGH THURSDAY MARCH 21, 1985

FROM \ TO	ROUTE 1		ROUTE 2		ROUTE 3		ROUTE 4		ROUTE 5		ROUTE 6		ROUTE 7		ROUTE 8		ROUTE 9		ROUTE 10		ROUTE 11		ROUTE 12		TOT
		ROW %		ROW %		ROW %		ROW %		ROW %		ROW %		ROW %		ROW %		ROW %		ROW %		ROW %		ROW %	
RT 1	2	.5	25	6.4	14	3.6	16	4.0	1	.3	21	5.3	196	49.7	88	22.5	8	2.0	3	.8	16	4.2	3	.8	3
COL %	.5		5.5		4.4		7.2		.5		6.7		7.8		7.6		1.4		.7		3.4		3.6		5
RT 2	20	4.3	1	.3	16	3.4	25	5.4	1	.1	21	4.4	261	56.1	86	18.4	6	1.3	9	2.0	19	4.2	0	.0	4
COL %	5.0		.3		4.9		11.7		.3		6.7		10.4		7.4		1.1		2.1		4.0		.0		6
RT 3	18	4.2	10	2.3	1	.2	27	6.3	1	.2	33	7.8	208	49.1	67	15.8	11	2.6	9	2.1	37	8.8	2	.6	4
COL %	4.5		2.1		.3		12.3		.3		10.7		8.3		5.8		2.0		2.0		7.8		2.5		5
RT 4	15	8.3	18	9.7	15	8.1	0	.2	1	.6	8	4.6	69	38.1	36	19.9	0	.2	4	2.4	15	8.1	0	.0	18
COL %	3.8		3.9		4.5		.2		.5		2.7		2.7		3.1		.1		1.0		3.0		.0		2
RT 5	2	.9	1	.5	1	.5	0	.2	0	.0	18	8.6	163	76.0	24	11.2	3	1.2	0	.0	2	.8	0	.2	21
COL %	.5		.2		.3		.2		.0		6.0		6.5		2.1		.5		.0		.3		.4		3.
RT 6	22	6.3	21	6.2	26	7.7	5	1.6	28	8.3	1	.2	134	39.8	58	16.9	8	2.3	6	1.8	31	9.0	0	.0	34
COL %	5.4		4.7		8.1		2.5		12.5		.2		5.4		5.0		1.4		1.3		6.4		.0		4.
RT 7	203	8.6	245	10.4	161	6.8	70	3.0	155	6.6	104	4.4	209	8.9	355	15.1	377	16.0	210	8.9	235	10.0	30	1.3	235
COL %	50.[illegible]		54.4		49.5		32.1		24.2		32.9		8.3		30.7		67.9		46.7		48.8		32.9		32.
RT 8	[illegible]	6.6	81	7.3	51	4.6	50	4.5	17	1.3	55	4.9	385	34.3	77	7.0	88	7.9	140	12.6	66	7.7	11	1.0	111
COL %	16.3		17.0		15.6		23.0		[illegible]		17.[illegible]		15.7		6.7		15.8		31.1		17.8		11.6		15.
RT 9	7	1.2	4	.8	5	1.0	2	.3	2	.4	5	.9	365	66.0	118	21.3	19	3.4	4	.8	7	1.3	15	2.8	55
COL %	1.[illegible]		1.0		1.6		.8		1.0		1.6		14.5		10.2		3.4		1.0		1.5		16.6		7.
RT 10	4	1.1	9	2.4	5	1.3	3	.8	0	.1	7	1.8	188	49.6	114	30.1	6	1.5	8	2.2	8	2.2	26	6.9	37
COL %	1.1		2.0		1.5		1.4		.2		2.2		7.5		9.9		1.0		1.9		1.7		28.2		5.
RT 11	19	3.5	28	5.2	23	4.2	16	3.0	2	.4	34	6.2	279	51.4	107	19.8	10	1.8	5	1.0	17	3.1	2	.4	54
COL %	4.8		6.2		7.0		7.5		1.0		10.9		11.1		9.3		1.7		1.2		3.5		2.2		7.
RT 12	9	9.5	1	.7	1	1.1	1	.7	1	1.1	0	.0	27	28.8	8	8.1	18	18.9	29	30.9	0	.4	0	.0	9
COL %	2.3		.1		.2		.2		.5		.0		1.1		.7		3.2		6.5		.1		.0		1.
SETC.	5	4.6	6	6.3	6	6.3	2	2.0	2	2.0	2	1.7	25	25.2	19	18.9	3	2.6	21	20.5	8	7.9	2	2.0	10
COL %	1.2		1.4		1.9		.9		1.0		.5		1.0		1.6		.5		4.6		1.7		7.2		1.
COLS	[illegible]	5.6	401	6.2	[illegible]	4.6	217	3.6	[illegible]	7.9	[illegible]	4.3	2512	35.1	1157	16.2	556	7.8	450	6.3	481	6.7	9[illegible]	1.3	71[illegible]

FIG. 5



1 MAIN PROCESSING UNIT (MPU)

2 MICROWAVE (SIGNPOST) RECEIVER

3 SIGNPOST POWER SUPPLY

4 SIGNPOST TRANSMITTER HEAD

5 FRONT DOOR PASSENGER COUNTER

6 REAR DOOR PASSENGER COUNTER

7 MOBILE RADIO

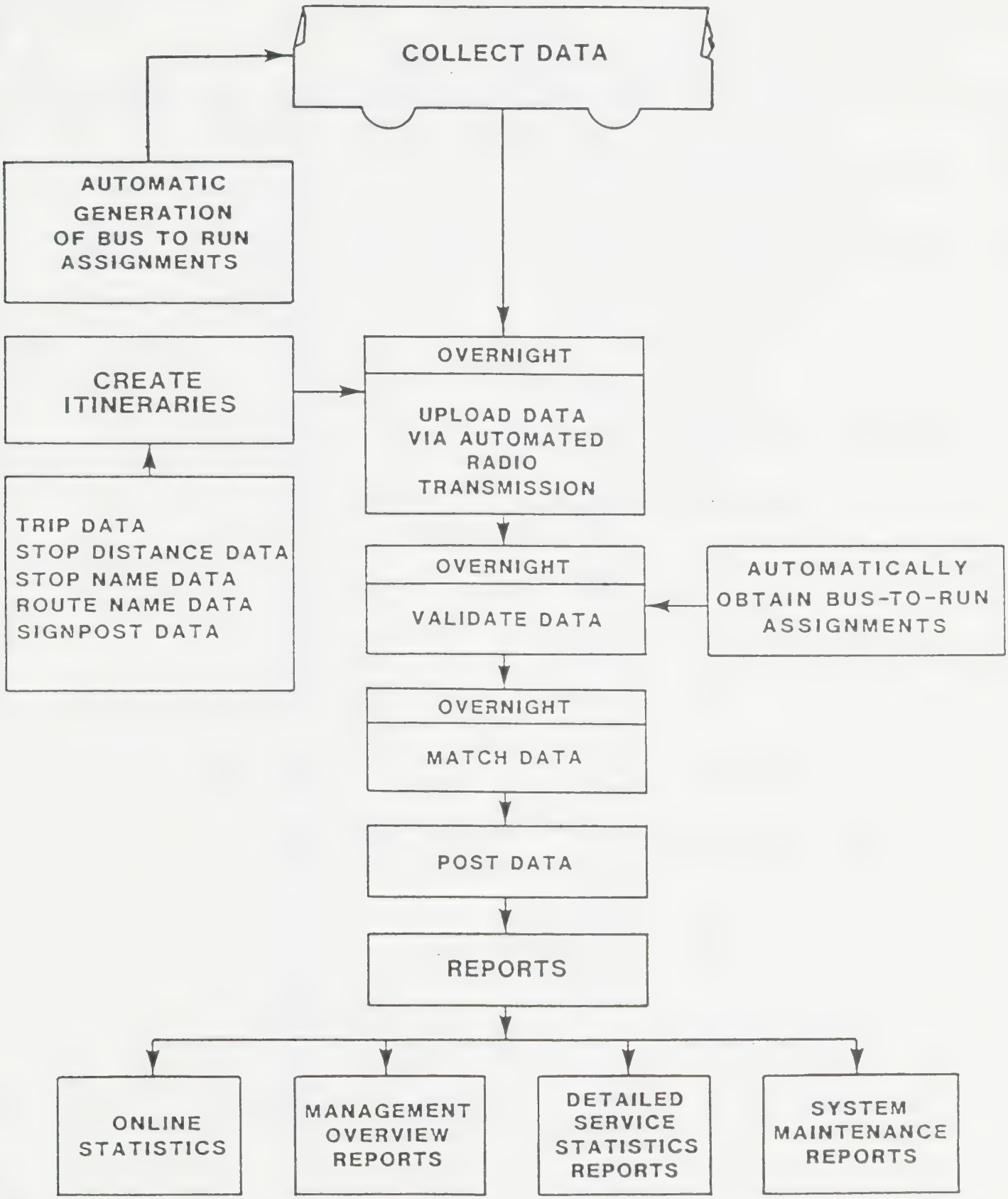
8 MOBILE RADIO ANTENNA

9 DATA TRANSFER CABLE

THE NEW APC ON BUS CONFIGURATION

FIG. 6

FIG. 7



-THE NEW APC SYSTEM : FLOW OF DATA

AUTOMATIC PASSENGER COUNTING SYSTEM
PASSENGER ACTIVITY BY STOP
WEEKDAY SERVICE

ROUTE: 22 UPPER OTTAWA
DIRECTION: OUTBOUND

FIGURE 8

PERIOD: 88-05-04 TO 88-05-04
03:01 TO 03:00

BSI STOP ID	LOCATION	ACTIVITY	MINIMUM	MAXIMUM	MEDIAN	AVERAGE	STD DEV	OBSERVED	STOPS	% SAMPLED
90817	KING STREET (SO HUGHSON STREET M	ONS	0	19	6	7.2	4.5	52	52	84
		OFFS	0	0	0	0.0	0.0	52	52	84
90205	JAMES STREET MAIN STREET M	ONS	0	17	3	3.6	4.0	52	41	84
		OFFS	0	6	0	0.8	1.2	52	41	84
80024	JAMES STREET JACKSON STREET F	ONS	0	7	0	0.6	1.2	52	21	84
		OFFS	0	2	0	0.1	0.4	52	21	84
80026	JAMES STREET BOLD STREET F	ONS	0	4	0	0.5	1.0	52	20	84
		OFFS	0	2	0	0.3	0.6	52	20	84
80028	JAMES STREET ROBINSON STREET N	ONS	0	2	0	0.1	0.4	52	8	84
		OFFS	0	1	0	0.1	0.3	52	8	84
80030	JAMES STREET CHARLTON AVENUE N	ONS	0	15	0	0.9	2.2	52	28	84
		OFFS	0	3	0	0.5	0.9	52	28	84
72800	ST. JOSEPH'S DR JAMES STREET SO F	ONS	0	0	0	0.0	0.0	52	1	84
		OFFS	0	0	0	0.0	0.0	52	1	84
72802	ST. JOSEPH'S DR MOUNTWOOD AVENU N	ONS	0	2	0	0.2	0.5	52	12	84
		OFFS	0	1	0	0.1	0.3	52	12	84
72804	ARKLEDUN AVENUE #46 ARKLEDUN AV M	ONS	0	1	0	0.0	0.1	52	5	84
		OFFS	0	1	0	0.1	0.2	52	5	84
50100	UPPER WELLINGTO CONCESSION STRE M	ONS	0	3	0	0.2	0.6	52	19	84
		OFFS	0	3	0	0.3	0.6	52	19	84
50102	UPPER WELLINGTO INVERNESS STREE N	ONS	0	3	0	0.2	0.7	52	11	84
		OFFS	0	1	0	0.1	0.3	52	11	84
51110	QUEENSDALE AVEN UPPER WELLINGTO M	ONS	0	3	0	0.4	0.8	52	25	84
		OFFS	0	3	0	0.4	0.7	52	25	84
51112	QUEENSDALE AVEN EAST 13TH STREE N	ONS	0	1	0	0.2	0.4	52	16	84
		OFFS	0	3	0	0.2	0.6	52	16	84
51114	QUEENSDALE AVEN EAST 15TH STREE N	ONS	0	2	0	0.1	0.4	52	10	84
		OFFS	0	2	0	0.2	0.5	52	10	84
51116	QUEENSDALE AVEN EAST 18TH STREE N	ONS	0	1	0	0.1	0.2	52	16	84
		OFFS	0	2	0	0.2	0.5	52	16	84
51118	QUEENSDALE AVEN UPPER WENTWORTH N	ONS	0	3	0	0.2	0.6	52	17	84
		OFFS	0	3	0	0.3	0.7	52	17	84

AUTOMATIC PASSENGER COUNTING SYSTEM
PASSENGER ACTIVITY BY STOP BY TIME PERIOD
WEEKDAY SERVICE

ROUTE: 22 UPPER OTTAWA
DIRECTION: OUTBOUND

PERIOD: 88-05-04 TO 88-05-04

FIGURE 9

BSI STOP ID	LOCATION		STATISTIC	EARLY 03:01-06:30 ONS	EARLY 03:01-06:30 OFFS	AM PEAK 06:31-09:30 ONS	AM PEAK 06:31-09:30 OFFS	MIDDAY 09:31-15:30 ONS	MIDDAY 09:31-15:30 OFFS	PM PEAK 15:31-18:30 ONS	PM PEAK 15:31-18:30 OFFS	EVENING 18:31-03:00 ONS	EVENING 18:31-03:00 OFFS	TOTAL ONS	TOTAL OFFS
90817	KING STREET (SO	HUGHSON ST	MINIMUM	0	0	0	0	1	0	10	0	2	0	0	0
			MAXIMUM	1	0	9	0	10	0	19	0	11	0	19	0
			MEDIAN	1	0	4	0	6	0	14	0	6	0	6	0
			AVERAGE	0.5	0.0	4.3	0.0	5.8	0.0	13.7	0.0	6.3	0.0	7.2	0.0
			STD DEV	0.7	0.0	2.4	0.0	2.4	0.0	2.5	0.0	2.6	0.0	4.5	0.0
			OBSERVED	2	2	12	12	15	15	12	12	11	11	52	52
			STOPS	2	2	12	12	15	15	12	12	11	11	52	52
			% SAMPLED	100	100	92	92	79	79	100	100	69	69	84	84
90205	JAMES STREET	MAIN STREE	MINIMUM	0	0	0	0	0	0	0	0	0	0	0	0
			MAXIMUM	1	0	12	6	6	2	17	3	9	2	17	6
			MEDIAN	1	0	1	1	1	0	7	1	3	0	3	0
			AVERAGE	0.5	0.0	2.8	1.3	2.3	0.4	6.8	1.3	3.3	0.4	3.6	0.8
			STD DEV	0.7	0.0	4.1	1.8	2.2	0.7	5.4	0.9	2.8	0.7	4.0	1.2
			OBSERVED	2	2	12	12	15	15	12	12	11	11	52	52
			STOPS	1	1	9	9	12	12	10	10	9	9	41	41
			% SAMPLED	100	100	92	92	79	79	100	100	69	69	84	84
80024	JAMES STREET	JACKSON ST	MINIMUM	0	0	0	0	0	0	0	0	0	0	0	0
			MAXIMUM	0	0	1	0	4	2	7	1	1	0	7	2
			MEDIAN	0	0	0	0	0	0	1	0	0	0	0	0
			AVERAGE	0.0	0.0	0.3	0.0	0.6	0.3	1.3	0.2	0.3	0.0	0.6	0.1
			STD DEV	0.0	0.0	0.5	0.0	1.1	0.6	2.0	0.4	0.5	0.0	1.2	0.4
			OBSERVED	2	2	12	12	15	15	12	12	11	11	52	52
			STOPS	0	0	3	3	6	6	8	8	4	4	21	21
			% SAMPLED	100	100	92	92	79	79	100	100	69	69	84	84
80026	JAMES STREET	BOLD STREE	MINIMUM	0	0	0	0	0	0	0	0	0	0	0	0
			MAXIMUM	0	0	1	1	4	2	3	2	2	0	4	2
			MEDIAN	0	0	0	0	0	1	1	0	0	0	0	0
			AVERAGE	0.0	0.0	0.1	0.1	0.7	0.7	1.1	0.3	0.2	0.0	0.5	0.3
			STD DEV	0.0	0.0	0.3	0.3	1.2	0.7	1.2	0.7	0.6	0.0	1.0	0.6
			OBSERVED	2	2	12	12	15	15	12	12	11	11	52	52
			STOPS	0	0	2	2	10	10	7	7	1	1	20	20
			% SAMPLED	100	100	92	92	79	79	100	100	69	69	84	84
80028	JAMES STREET	ROBINSON S	MINIMUM	0	0	0	0	0	0	0	0	0	0	0	0
			MAXIMUM	0	0	1	1	0	0	2	1	1	1	2	1
			MEDIAN	0	0	0	0	0	0	0	0	0	0	0	0
			AVERAGE	0.0	0.0	0.1	0.1	0.0	0.0	0.2	0.2	0.2	0.1	0.1	0.1
			STD DEV	0.0	0.0	0.3	0.3	0.0	0.0	0.6	0.4	0.4	0.3	0.4	0.3
			OBSERVED	2	2	12	12	15	15	12	12	11	11	52	52
			STOPS	0	0	2	2	0	0	2	2	4	4	8	8
			% SAMPLED	100	100	92	92	79	79	100	100	69	69	84	84

AUTOMATIC PASSENGER COUNTING SYSTEM
DISTRIBUTION OF RUNNING TIMES BY SECTION
WEEKDAY SERVICE

ROUTE: 22 UPPER OTTAWA
START BSI: 50101 UPPER WELLINGTO CONCESSION STRE N
END BSI: 90817 KING STREET (SO HUGHSON STREET M

PERIOD: 88-05-04 TO 88-05-04

FIGURE 10

TIME PERIOD	MEAN	MEDIAN	ST DEV	NO OBS	RUNNING TIMES (MINUTES) 3	4	5	6	7	8	9	10	11	12
06:01 - 07:00	5.7	6	0.0	1	0	0	1	0	0	0	0	0	0	0
07:01 - 08:00	6.8	7	1.1	4	0	0	1	1	2	0	0	0	0	0
08:01 - 09:00	6.7	6	0.8	3	0	0	0	2	1	0	0	0	0	0
09:01 - 10:00	6.8	7	0.7	5	0	0	0	3	2	0	0	0	0	0
10:01 - 11:00	5.9	6	0.2	3	0	0	2	1	0	0	0	0	0	0
11:01 - 12:00	7.0	7	0.7	3	0	0	0	1	2	0	0	0	0	0
12:01 - 13:00	6.8	7	1.1	3	0	0	1	1	1	0	0	0	0	0
13:01 - 14:00	7.1	7	0.9	2	0	0	0	1	1	0	0	0	0	0
14:01 - 15:00	6.1	6	0.5	3	0	0	2	1	0	0	0	0	0	0
15:01 - 16:00	7.4	7	0.5	4	0	0	0	1	2	1	0	0	0	0
16:01 - 17:00	6.9	7	0.4	4	0	0	0	3	1	0	0	0	0	0
17:01 - 18:00	7.7	8	1.3	4	0	0	1	0	1	2	0	0	0	0
18:01 - 19:00	6.0	6	0.6	3	0	0	2	1	0	0	0	0	0	0
19:01 - 20:00	6.0	6	1.4	2	0	1	0	1	0	0	0	0	0	0
20:01 - 21:00	5.2	5	1.0	2	0	1	1	0	0	0	0	0	0	0
21:01 - 22:00	5.8	6	0.4	2	0	0	1	1	0	0	0	0	0	0
22:01 - 23:00	4.7	5	1.3	2	1	0	1	0	0	0	0	0	0	0
23:01 - 24:00	6.5	7	0.0	1	0	0	0	1	0	0	0	0	0	0
24:01 - 25:00	5.1	5	0.5	2	0	1	1	0	0	0	0	0	0	0

ROUTE: 22 UPPER OTTAWA
DIRECTION: OUTBOUND
PATTERN: 2

PERIOD: 88-05-04 TO 88-05-04

FIGURE 11

SECTION				TIME PERIOD					AM PEAK		PM PEAK	
NODES	FROM/TO	STOPS	STATISTIC	EARLY	AM PEAK	MIDDAY	PM PEAK	EVENING	HOUR	1/4 HOUR	HOUR	1/4 HOUR
1300-2302	KING STREET (SO HUG ARKLEDUN AVENUE #46	90817-50100	MINIMUM	0	1	6	15	2	6 07:31-	8 07:46-	19 16:01-	29 16:16-
			MAXIMUM	0	8	6	29	16	8 08:30	8 08:00	29 17:00	29 16:30
			MEDIAN	0	4	6	19	8	7	8	24	29
			AVERAGE	0.0	4.3	6.3	20.4	8.7	6.9	7.9	24.0	28.7
			STD DEV	0.0	2.5	0.0	5.6	4.8	1.3	0.0	6.7	0.0
			OBSERVED	1	6	1	6	5	2	1	2	1
			% SAMPLED	100	100	50	100	63	100	100	100	100
2302-3400	UPPER WELLINGTO CON QUEENSDALE AVEN EAS	50100-51118	MINIMUM	0	3	4	15 *	3	6 07:31-	8 07:46-	21 16:01-	29 16:16-
			MAXIMUM	0	8	4	29	16	8 08:30	8 08:00	29 17:00	29 16:30
			MEDIAN	0	5	4	21	9	7	8	25	29
			AVERAGE	0.0	5.0	4.4	21.4	9.1	7.2	8.5	24.9	28.8
			STD DEV	0.0	2.2	0.0	5.0	4.8	1.7	0.0	5.5	0.0
			OBSERVED	1	6	1	6	5	2	1	2	1
			% SAMPLED	100	100	50	100	63	100	100	100	100
3400-3403	QUEENSDALE AVEN UPP QUEENSDALE AVEN EAS	51118-51132	MINIMUM	0	1	4	15	3 *	9 07:46-	13 08:31-	19 16:16-	26 16:31-
			MAXIMUM	0	13	4	26	14	13 08:45	13 08:45	26 17:15	26 16:45
			MEDIAN	0	5	4	18	10	11	13	22	26
			AVERAGE	0.0	6.3	4.0	18.8	9.1	11.2	13.0	22.4	26.2
			STD DEV	0.0	4.2	0.0	4.1	4.1	2.5	0.0	5.4	0.0
			OBSERVED	1	6	1	6	5	2	1	2	1
			% SAMPLED	100	100	50	100	63	100	100	100	100
3403-4500	QUEENSDALE AVEN UPP UPPER OTTAWA ST BRU	51132-50512	MINIMUM	1	1 *	7	14	2	13 07:46-	27 08:31-	17 16:16-	25 16:31-
			MAXIMUM	1	27	7	25	12	27 08:45	27 08:45	25 17:15	25 16:45
			MEDIAN	1	5	7	16	9	20	27	21	25
			AVERAGE	1.0	8.9	6.5	17.0	8.5	19.8	27.1	20.7	24.5
			STD DEV	0.0	9.7	0.0	3.9	3.7	10.3	0.0	5.4	0.0
			OBSERVED	1	6	1	6	5	2	1	2	1
			% SAMPLED	100	100	50	100	63	100	100	100	100
4500-4501	UPPER OTTAWA ST FEN UPPER OTTAWA ST 10T	50512-50520	MINIMUM	1	1	15 *	15	3	12 07:46-	16 08:31-	24 15:46-	25 16:01-
			MAXIMUM	1	16	15	25	11	16 08:45	16 08:45	25 16:45	25 16:15
			MEDIAN	1	7	15	18	9	14	16	24	25
			AVERAGE	1.0	7.3	14.7	19.4	8.5	14.2	16.5	24.2	24.9
			STD DEV	0.0	6.3	0.0	4.0	3.4	3.2	0.0	0.9	0.0
			OBSERVED	1	6	1	6	5	2	1	2	1
			% SAMPLED	100	100	50	100	63	100	100	100	100

* MAXIMUM AVERAGE LOAD POINT FOR TIME PERIOD

STOP: 70225 JOHN STREET YOUNG STREET N
ROUTE: 22 UPPER OTTAWA
DIRECTION: INBOUND

PERIOD: 88-05-04 TO 88-05-04
03:01 TO 03:00

FIGURE 12

	RUN	PAT	TIME EXPECTED	TIME ACTUAL	DIFFERENCE	LOAD AT DEPARTURE	DATE
*	22-001A	1	05:56				
*	22-002A	1	06:11				
*	22-004A	1	06:26				
*	22-005A	1	06:41				
	22-003A	2	06:56	06:53	-3	17	88-05-04
	22-001A	3	07:11	07:09	-2	21	88-05-04
	22-002A	2	07:26	07:26	0	17	88-05-04
	22-004A	3	07:41	07:40	-1	17	88-05-04
	22-005A	2	07:56	07:55	-1	26	88-05-04
	22-003A	3	08:11	08:09	-2	31	88-05-04
	22-001A	2	08:26	08:27	1	28	88-05-04
	22-002A	3	08:38	08:40	2	22	88-05-04
*	22-004A	2	08:53				
	22-005A	3	09:07	09:06	-1	9	88-05-04
	22-003A	2	09:22	09:21	-1	16	88-05-04
	22-001A	3	09:37	09:33	-4	16	88-05-04
	22-002A	2	09:56	09:55	-1	13	88-05-04
	22-004A	3	10:04	09:58	-6	2	88-05-04
	22-005A	2	10:18	10:14	-4	11	88-05-04
	22-003A	3	10:36	10:33	-3	12	88-05-04
	22-001A	2	10:56	10:57	1	13	88-05-04
	22-002A	3	11:16	11:13	-3	17	88-05-04
	22-005A	2	11:36	11:31	-5	5	88-05-04
	22-003A	3	11:56	11:54	-2	11	88-05-04
	22-001A	2	12:16	12:14	-2	8	88-05-04
	22-002A	3	12:36	12:36	0	14	88-05-04
	22-005A	2	12:56	12:53	-3	8	88-05-04
	22-003A	3	13:16	13:13	-3	12	88-05-04
	22-001A	2	13:36	13:33	-3	24	88-05-04
*	22-002A	3	13:56				
	22-005A	2	14:15	14:13	-2	12	88-05-04
	22-003A	3	14:29	14:28	-1	23	88-05-04
	22-001A	2	14:56	14:56	0	27	88-05-04
	22-002A	3	15:11	15:09	-2	10	88-05-04
	22-005A	2	15:26	15:24	-2	6	88-05-04
	22-003A	3	15:41	15:38	-3	14	88-05-04
	22-006P	2	15:56	15:56	0	18	88-05-04
	22-001A	3	16:11	16:11	0	20	88-05-04
	22-002A	2	16:26	16:25	-1	12	88-05-04
	22-005A	3	16:41	16:40	-1	10	88-05-04
	22-003A	2	16:56	16:51	-5	13	88-05-04
	22-006P	3	17:11	17:08	-3	7	88-05-04
	22-001A	2	17:26	17:24	-2	7	88-05-04
	22-002A	3	17:41	17:39	-2	16	88-05-04
	22-005A	2	17:56	17:49	-7	4	88-05-04

* DATA NOT AVAILABLE

AUTOMATIC PASSENGER COUNTING SYSTEM
ROUTE DIRECTION SUMMARY
WEEKDAY SERVICE

ROUTE: 22 UPPER OTTAWA
DIRECTION: OUTBOUND

PERIOD: 88-05-04 TO 88-05-04
03:01 TO 03:00

FIGURE 12-1

RUN	TRIP START NODE	TRIP END NODE	TRIP DEPARTURE TIME SCHED	TRIP DEPARTURE TIME ACT	TRIP DEPARTURE TIME DIF	TOTAL ONS	TOTAL OFFS	MAX LOAD	MAX LOAD POINT	TRIP ARRIVAL TIME SCHED	TRIP ARRIVAL TIME ACT	TRIP ARRIVAL TIME DIF
22-003A	1300 GORE PARK	6501 HAMILTON MOUNTAIN	05:45	05:40	-5	5	5	4	50536	06:19	06:07	-12
22-001A	1300 GORE PARK	7501 NEBO & RYMAL	06:00	06:00	0	9	9	5	51120	06:35	06:30	-5
22-002A	1300 GORE PARK	6501 HAMILTON MOUNTAIN	06:15	06:16	1	9	9	9	50512	06:49	07:01	12
22-004A	1300 GORE PARK	7501 NEBO & RYMAL	06:30	06:30	0	8	8	7	72802	07:05	06:55	-10
22-005A	1300 GORE PARK	6501 HAMILTON MOUNTAIN	06:45	06:46	1	6	6	5	50512	07:19	07:13	-6
22-003A	1300 GORE PARK	7501 NEBO & RYMAL	07:00	06:55	-5	10	10	8	51128	07:35	07:32	-3
22-001A	1300 GORE PARK	6501 HAMILTON MOUNTAIN	07:15	07:15	0	9	9	4	50526	07:49	07:46	-3
22-002A	1300 GORE PARK	7501 NEBO & RYMAL	07:30	07:34	4	23	23	17	50512	08:05	08:03	-2
22-004A	1300 GORE PARK	6501 HAMILTON MOUNTAIN	07:45	07:46	1	25	25	13	51134	08:19	08:15	-4
22-005A	1300 GORE PARK	7501 NEBO & RYMAL	08:00	08:00	0	44	44	22	51112	08:35	08:34	-1
22-003A	1300 GORE PARK	6501 HAMILTON MOUNTAIN	08:15	08:15	0	49	49	30	51132	08:49	08:47	-2
22-001A	1300 GORE PARK	7501 NEBO & RYMAL	08:30	08:31	1	9	9	5	50512	09:05	08:56	-9
22-002A	1300 GORE PARK	6501 HAMILTON MOUNTAIN	08:42	08:43	1	19	19	9	51122	09:23	09:23	0
22-004A	1300 GORE PARK	7501 NEBO & RYMAL	08:57							09:32		
22-005A	1300 GORE PARK	6501 HAMILTON MOUNTAIN	09:11	09:12	1	7	7	4	50102	09:45	09:38	-7
22-003A	1300 GORE PARK	7501 NEBO & RYMAL	09:26	09:27	1	7	7	4	50512	10:01	10:01	0
22-001A	1300 GORE PARK	6501 HAMILTON MOUNTAIN	09:41	09:40	-1	7	7	5	51126	10:22	10:16	-6
22-002A	1300 GORE PARK	7501 NEBO & RYMAL	10:00	10:01	1	13	13	8	80024	10:35	10:30	-5
22-005A	1300 GORE PARK	6501 HAMILTON MOUNTAIN	10:22	10:22	0	14	14	8	50508	11:03	11:08	5
22-003A	1300 GORE PARK	7501 NEBO & RYMAL	10:40							11:15		
22-001A	1300 GORE PARK	6501 HAMILTON MOUNTAIN	11:00	11:00	0	18	18	12	51112	11:41	11:39	-2
22-002A	1300 GORE PARK	7501 NEBO & RYMAL	11:20	11:20	0	14	14	10	80026	11:55	11:49	-6
22-005A	1300 GORE PARK	6501 HAMILTON MOUNTAIN	11:40	11:41	1	21	21	13	51126	12:21	12:18	-3
22-003A	1300 GORE PARK	7501 NEBO & RYMAL	12:00	12:00	0	22	22	11	80026	12:35	12:38	3
22-001A	1300 GORE PARK	6501 HAMILTON MOUNTAIN	12:20	12:20	0	22	22	13	80024	13:01	12:58	-3
22-002A	1300 GORE PARK	7501 NEBO & RYMAL	12:40							13:15		
22-005A	1300 GORE PARK	6501 HAMILTON MOUNTAIN	13:00	13:01	1	26	26	9	51130	13:41	13:42	1
22-003A	1300 GORE PARK	7501 NEBO & RYMAL	13:20	13:20	0	52	52	15	50512	13:55	13:52	-3
22-001A	1300 GORE PARK	6501 HAMILTON MOUNTAIN	13:40							14:21		
22-002A	1300 GORE PARK	7501 NEBO & RYMAL	14:00	14:01	1	27	27	14	90205	14:36	14:32	-4
22-005A	1300 GORE PARK	6501 HAMILTON MOUNTAIN	14:19	14:19	0	25	25	15	50512	14:53	14:50	-3
22-003A	1300 GORE PARK	7501 NEBO & RYMAL	14:33	14:32	-1	20	20	9	80024	15:09	15:03	-6
22-006P	1300 GORE PARK	6501 HAMILTON MOUNTAIN	14:48							15:23		
22-001A	1300 GORE PARK	7501 NEBO & RYMAL	15:00	15:01	1	29	29	10	72802	15:36	15:37	1
22-002A	1300 GORE PARK	6501 HAMILTON MOUNTAIN	15:15	15:14	-1	37	37	22	51110	15:50	15:47	-3
22-005A	1300 GORE PARK	7501 NEBO & RYMAL	15:30	15:31	1	44	44	25	50526	16:06	16:04	-2
22-003A	1300 GORE PARK	6501 HAMILTON MOUNTAIN	15:45	15:44	-1	57	57	26	50512	16:20	16:19	-1
22-006P	1300 GORE PARK	7501 NEBO & RYMAL	16:00	16:00	0	54	54	25	51118	16:36	16:33	-3
22-001A	1300 GORE PARK	6501 HAMILTON MOUNTAIN	16:15	16:16	1	48	48	31	72802	16:50	16:53	3
22-002A	1300 GORE PARK	7501 NEBO & RYMAL	16:30	16:30	0	49	49	30	80030	17:06	17:06	0
22-005A	1300 GORE PARK	6501 HAMILTON MOUNTAIN	16:45	16:45	0	35	35	21	50100	17:20	17:22	2
22-003A	1300 GORE PARK	7501 NEBO & RYMAL	17:00	16:59	-1	43	43	31	50100	17:36	17:37	1
22-006P	1300 GORE PARK	6501 HAMILTON MOUNTAIN	17:15	17:15	0	37	37	28	80030	17:50	17:48	-2
22-001A	1300 GORE PARK	7501 NEBO & RYMAL	17:30	17:30	0	52	52	33	80026	18:06	18:11	5
22-002A	1300 GORE PARK	6501 HAMILTON MOUNTAIN	17:45	17:45	0	43	43	19	50102	18:20	18:19	-1
22-005A	1300 GORE PARK	7501 NEBO & RYMAL	18:00	18:01	1	22	22	14	80026	18:36	18:32	-4
22-003A	1300 GORE PARK	6501 HAMILTON MOUNTAIN	18:15	18:15	0	11	11	4	50522	18:50	18:44	-6

AUTOMATIC PASSENGER COUNTING SYSTEM
SCHEDULE ADHERENCE AT TIMING POINTS
WEEKDAY SERVICE

ROUTE: 22 UPPER OTTAWA
DIRECTION: OUTBOUND

PERIOD: 88-05-04 TO 88-05-04
03:01 TO 03:30

FIGURE 13

NODE	DESCRIPTION	EARLIEST	LATEST	AVERAGE	STD DEV	> 0 MIN EARLY	> 3 MIN LATE	OBSERVED	% SAMPLED
1300	GORE PARK	-5	4	0.0	1.4	17	1	52	84
2302	CONCESSION & UPPER W	-9	4	0.9	1.9	15	5	52	84
3400	UPPER WENTWORTH & QU	-11	3	-0.1	2.1	23	1	52	84
3403	UPPER GAGE & QUEENSD	-10	3	-0.7	2.1	33	1	52	84
4500	UPPER OTTAWA & FENNE	-10	3	-1.0	2.5	33	2	52	84
4501	UPPER OTTAWA & MOHAW	-12	3	-1.6	2.6	36	0	52	84
6500	UPPER OTTAWA & STONE	-12	8	-1.0	3.5	33	5	52	84
7501	NEBO & RYMAL	-10	5	-1.8	4.0	16	3	25	83
6501	HAMILTON MOUNTAIN BO	-12	12	-1.6	4.5	18	3	26	84
6503		-5	4	-0.3	2.8	4	1	7	88
6600	UPPER MOUNT ALBION R	-4	6	0.9	2.9	2	1	7	88

FIG. 14

HAMILTON STREET RAILWAY - STOP & SHELTER MAINTENANCE DESCRIPTION FIELD SHEET

(1) ROUTE: MOHAWK RD. - 41 (2) DATE SURVEYED: (DAY) 07 (MO.) MAY (YR) 86 (3) SURVEYED BY: C.C.

(4) STP NO.	(5) BUS CHK NO.	(6) TRF ZNE NO.	(7) ON STREET	(8) AT STREET	(9) MUN	(10) RD. AUTH. CTY	(10) RD. AUTH. REG	(11) WRD NO.	(12) NDE ABBR.	(13) STOP LOC NS	(13) STOP LOC FS	(13) STOP LOC MB	(14) STOP TYPE B	(14) SL	(14) RL	(14) TW	(14) T	(14) SP	(14) LP	(15) LOOP COND. CB	(15) PV	(15) GR	(15) DT	(16) SIGN POST I.D.
5.0.0.1.9	8.3.7.1		MOHAWK RD	JAMES ST.	H		✓	7		✓					✓									

(17) CORNER NS OR FS NE	NW	SE	SW	MID BLOCK NS	SS	ES	WS	(18) DIR O/I	(19) BUS BAY TAPER I	B	O	W	(20) TYPE OF POLE CP	IP	WTP	WHP	CHP	IHP	SCP	SSHP	WBP	GP	TSP	OP	SSPB 1	2	SSP 1	2	OTSP	U	SH	T	OTHR	(21) UTIL NO.
✓								I								✓																		

(22) TYPE MARKER STD	ENL	RD	INFO	KD	PI	SM	(23) INFO. TAB MARKER	DISPLAY	OTHER	(24) CONDITION G	F	P	OTHER	(25) PROPERTY PRIV	PUBL	(26) STOP *DTCL	(27) SHELTER *DTCL
	✓						1	2		✓					ST	6.1m EECL, 0.6 m NNCL	13.4 m EECL, 3m NNCL

(28) TRAFFIC REGULATION SIGNS	AFTER MARKER POLE NP	NS	OTH	*DTCL	ON MARKER POLE NP	NS	OTH	*DTCL	BEFORE MARKER POLE NP	NS	OTH	*DTCL	(29) APP. *DTCL & LGTH. 1 ST.	2 ND.	(30) CATCH BASIN *DTCL	(31) SHELTER TYPE SIZE	MFG D	MFG T	PAD	ENT	OTHER	(32) GLASS TG	LP
ARR. TIM. DAY										W ALL ALL		30.1m EECL			7.4m EECL	4' X 11'	✓			SS		✓	

(33) GROUND CONDITIONS CSP	CP	CSW	AP	APS	GB	GR	PS	PSH	WSP	R	CC	AB	CD	IPS	DFP	OTHER	(34) ROUTES SERVING THIS STOP	(35) DATE & DESCRIPTION
		✓			✓												41I, 31E/O	

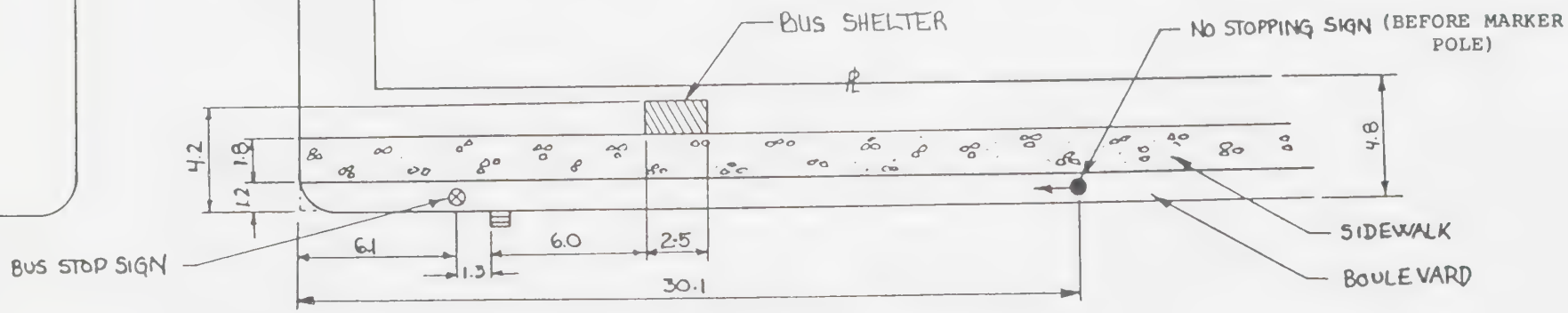
(36) MISCELLANEOUS AB	BI	CB	OVH	GB	LB	NB	MB	MSB	FH	EUB	OTHR	(37) COMMENTS
	✓	✓	✓	✓		✓(1)						COVERED GUIDEWIRE CONNECTED TO POLE EAST OF STOP MARKER ON BOULEVARD.

* NOTE: DTCL - DISTANCE TO CURB LINES

-FIGURE 2-

NEAR-SIDE BUS STOP, SHELTER, AND TRAFFIC REGULATION SIGNS
SAMPLE LAYOUT AND MEASUREMENT DESCRIPTION

STOP DTCL*: 6.1 METRES EAST OF THE EAST CURB LINE (or 6.1M EECL),
0.6 METRES NORTH OF THE NORTH CURB LINE (or 0.6M NNCL)
SHELTER DTCL: 13.4 METRES EAST OF THE EAST CURB LINE (or 13.4M EECL),
3 METRES NORTH OF THE NORTH CURB LINE (or 3M NNCL)
TRAFFIC REGULATION DTCL: 30.1 METRES EAST OF THE EAST CURB LINE (or 30.1M EECL)
(BEFORE MARKER POLE) ARROW POINTING WEST
CATCH BASIN DTCL: 7.4 METRES EAST OF THE EAST CUR LINE (or 7.4M EECL)



N

*NOTE: DTCL MEANS DISTANCE TO CURB LINES

THE REGIONAL MUNICIPALITY OF HAMILTON-WENTWORTH TRANSPORTATION DEPARTMENT			
General Arrangement Drawing Only NOT FOR CONSTRUCTION PURPOSES			
Date NOV 13, 1986	Drawing No 1	Scale 1:200	Approved
Revision	Location		
	Installed		
Measurements will vary depending on specific site conditions.			

FIG. 15

FIG. 16

HAMILTON STREET RAILWAY SSM

DATA ENTRY

MODE: L LIST

STOP #: 50017 BUS CHECK #: 2309 TRAFFIC ZONE: 000 SURVEY DATE: 07-MAY-86

ON ST: UPPER JAMES STREET AT ST: MOHAWK ROAD

MUN: H ROAD AUTHORITY: R WARD #: Z NODE ABBREVIATION: UPJAMOHK

STOP LOC: NS STOP TYPE: IW LOOP COND: _ SIGNPOST ID: 000 CORNER: SE

DIRECTION: I BAY TAPER: _ I: _.__ B: _.__ O: _.__ W: _.__

POLE TYPE: WHP UTIL #: _____ TYPE MARKER: ENL.

INFO.TAB - MARKER: 1.__ DISPLAY: _.__ OTHER: _____ CONDITION: _

DETAIL COND: _____ PRIV. PROPERTY: _.__ PUBL. PROPERTY: ST.

SCREEN 1

HAMILTON STREET RAILWAY SSM

DATA ENTRY

LIST STOP #: 72377 BUS CHECK #: 0000 SIGNPOST ID: 000

STOP DTCL: 17.1M EECL, 0.6M NNCL
SHELTER DTCL: 18.5M EECL, 2.0M NNCL

AFTER MARKER POLE	TRAFFIC REGULATION SIGNS * NP *	* NS *	* OTHER *	* DTCL *
ARROW DIR	_	_	_	
TIME RES				
DAY RES				
ON MARKER POLE	_	E	_	17.1M EECL
		ALL		
		ALL		
BEFORE MARKER POLE	_	W	_	84.2M EECL
		ALL		
		ALL		

SCREEN 2

FIG. 17

HAMILTON STREET RAILWAY SSM

DATA ENTRY

LIST STOP #: 72527 BUS CHECK #: 0000 SIGNPOST ID: 000

APPROACHES DTCL - 1ST: 13.05M FECL LENGTH: 5.8
2ND: _____ _.

CATCH BASIN DISTANCE TO CURB LINE: 3.18M FECL

SHELTER SIZE: 32*00 MANUFACTURER: D PAD: __ ENT: SS OTHER: _____
GLASS: IG

GROUND CONDITION

F: __ B: _ _ _ S: _ _ _ _ L: CSW OTHER: ____

ROUTES AND DIRECTIONS SERVING THE STOP

1I 1AI ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

DATE & DESCTIPTION: _____

SCREEN 3

HAMILTON STREET RAILWAY SSM

DATA ENTRY

LIST STOP #: 72527 BUS CHECK #: 0000 SIGNPOST ID: 000

MISCELLANEOUS: OVH.NB .MB . . . . . .

COMMENT: THREE SIDED DATECH SHELTER.COMPLETELY OPEN ON STREET SIDE

HISTORY

CHANGE	DATE	REASON
	- -	
	- -	
	- -	
	- -	
	- -	

SCREEN 4

FIG. 18

HAMILTON STREET RAILWAY

BUS STOP MASTER INDEX

APC STOP	ON STREET LOCATION	AT STREET LOCATION	MUNICIPALITY	WARD	STOP LOCATION CODE	CORNER	POLE TYPE	MARKER TYPE	SHELTER MANUFACTURER
83018	ABERDEEN AVENUE	COTTAGE AVENUE	H	1	NS	SW	IP	STD	
83017	ABERDEEN AVENUE	DUNDURN STREET	H	1	NS	NW	U	STD	
83020	ABERDEEN AVENUE	DUNDURN STREET	H	1	NS	SW	OTSP	ENL	
83022	ABERDEEN AVENUE	FLATT AVENUE	H	1	NS	SW	U	STD	
83014	ABERDEEN AVENUE	KENT STREET	H	1	NS	SW	GP	STD	
83011	ABERDEEN AVENUE	KENT STREET	H	1	NS	NE	OTH	STD	
83021	ABERDEEN AVENUE	LINWOOD AVENUE	H	1	NS	NE	WBP	STD	
83013	ABERDEEN AVENUE	LOCKE STREET	H	1	NS	NE	WHP	STD	
83025	ABERDEEN AVENUE	LONGWOOD ROAD	H	1	MB	NS	WBP	STD	
83028	ABERDEEN AVENUE	LONGWOOD ROAD	H	1	MB	SS	U	STD	
83030	ABERDEEN AVENUE	LONGWOOD ROAD LOOP	H	1	MB	NS	U	STD	
83015	ABERDEEN AVENUE	OPP COTTAGE AVENUE	H	1	MB	NS	WHP	STD	
83019	ABERDEEN AVENUE	OPP FLATT AVENUE	H	1	MB	NS	WHP	STD	
83024	ABERDEEN AVENUE	OPP LINWOOD AVENUE	H	1	MB	SS	SSP1	STD	
83023	ABERDEEN AVENUE	OPP STUDHOLME ROAD	H	1	MB	NS	WBP	STD	
83012	ABERDEEN AVENUE	SPRUCESIDE AVENEU	H	1	NS	SW	OP	STD	
83026	ABERDEEN AVENUE	STUDHOLME AVENUE	H	1	FS	SE	WBP	STD	
83016	ABERDEEN AVENUE	UNDERMOUNT AVENUE	H	1	NS	SW	IP	STD	
71339	AMBROSE AVENUE	GREENHILL AVENUE	H	5	MB	ES	IP	STD	
60302	ANGELA AVENUE	UPPER PARADISE ROAD	H	8	NS	SW	WHP	STD	
25024	ANSON DRIVE	HWY #53	A	5	NS	NW	WHP	ENL	
72803	ARKLEDUN AVENUE	# 35 ARKLEDUN AVENUE	H	2	MB	NS	WBP	STD	
72804	ARKLEDUN AVENUE	#46 ARKLEDUN AVENUE	H	2	MB	SS	OP	STD	
40129	AUBREY AVENUE	HIGHLAND ROAD	S	1	NS	SE	WHP	ENL	
40131	AUBREY AVENUE	OPP BYRON AVENUE	S	1	MB	ES	WHP	ENL	
72701	AUGUSTA STREET	JAMES STREET	H	2	MB	SS	WBP	STD	
72703	AUGUSTA STREET	JOHN STREET	H	2	NS	SW	WBP	STD	
72381	BARTON STREET	#2434 BARTON STREET-POP SHOPPE	H	5	MB	NS	WBP	STDSM	D
72384	BARTON STREET	#2520 BARTON STREET	H	5	MB	SS	U	STD	
72387	BARTON STREET	#2553 BARTON STREET	H	5	MB	NS	WBP	STD	
72395	BARTON STREET	#2751 BARTON STREET	H	5	MB	NS	WBP	STD	
72394	BARTON STREET	#2772 BARTON STREET	H	5	MB	SS	WTP	STD	
72361	BARTON STREET	ADELINE AVENUE	H	4	MB	NS	WHP	STD	
43006	BARTON STREET	APPLE DRIVE	S	4	NS	SW	WHP	ENL	
[illegible]	BARTON STREET	BARNESDALE AVENUE	H	3	NS	NE	WHP	STD	
72[illegible]4	BARTON STREET	BARNESDALE AVENUE	H	3	NS	SW	WHP	STD	

SHELTER MASTER INDEX

APC STOP	ON STREET LOCATION	AT STREET LOCATION	SHELTER MANUFACTURER	SHELTER SIZE	SHELTER PAD HEIGHT	SHELTER ENTRANCE SIDE	SHELTE GLASS TYPE
72381	BARTON STREET	#2434 BARTON STREET-POP SHOPPE	D	120320	00	SS	TG
72379	BARTON STREET	KENORA AVENUE	D	120310		SS	
72378	BARTON STREET	KENORA AVENUE	D	120320	30	SS	TG
72303	BARTON STREET	MARY STREET	D	120310	70	SS	TG
72377	BARTON STREET	NASH ROAD	D	120320	20	SS	TG
72343	BARTON STREET	OPP. FREDERICK STREET	D	1224		SS	TG
71420	BEACH BLVD	#316 BEACH BLVD	D	120330		SS	TG
72119	BURLINGTON STREET	SHERMAN AVENUE	D	1224		SS	LP
72113	BURLINGTON STREET	WENTWORTH STREET	D	120310		SS	TG
51011	CONCESSION STREET	EAST 11TH STREET	D	150300	00	SS	TG
51033	CONCESSION STREET	MOUNTAIN PARK AVENUE	D	3101	00	SS	TG
51023	CONCESSION STREET	POPLAR AVENUE	D	120240		SS	TG
51018	CONCESSION STREET	UPPER WENTWORTH STREET	D	310122	00	SS	TG
72678	EASTGATE SQUARE	TERMINAL	D	2951		SS	TG
72676	EASTGATE SQUARE	TERMINAL	D	2951		SS	TG
72675	EASTGATE SQUARE	TERMINAL	D	2951		NS	TG
51232	FENNELL AVENUE	UPPER GAGE AVENUE	D	320120		SS	TG
51233	FENNELL AVENUE	UPPER GAGE AVENUE	D	120310	00	NS	TG
51224	FENNELL AVENUE	UPPER SHERMAN AVENUE	D	120320	20	SS	TG
51206	FENNELL AVENUE	UPPER WELLINGTON STREET	D			SS	TG
25021	FIDDLERS GREEN ROAD	WILSON STREET	D			SS	TG
60203	GARTH STREET	FENNELL AVENUE	D	244122		SS	TG
60217	GARTH STREET	MOHAWK ROAD	D	150300	00	SS	TG
48021	GORDON DRUMMOND DRIVE	ISAAC BROCK DRIVE	D	1224		NS	TG
72872	GREENHILL LOOP	SUMMERCREST DRIVE	D	310120	90	SS	TG
44029	HIGHWAY 8	WORSLEY ROAD	D	1202	10	NS	LP
70111	HUGHSON STREET	BARTON STREET	D	120320	00	SS	TG
80026	JAMES STREET	BOLD STREET	D	122245	70	NS	TG
80030	JAMES STREET	CHARLTON AVENUE	D	122245	50	SS	TG
90208	JAMES STREET	MAIN STREET	D	122245		SS	TG
70918	KENILWORTH AVENUE	#103 KENILWORTH AVENUE	D	120330	100	SS	TG
70911	KENILWORTH AVENUE	BARTON STREET	D	330008	100	SS	TG
70910	KENILWORTH AVENUE	BARTON STREET	D	120310	30	SS	TG
70937	KENILWORTH TRAFFIC CIRCLE	EAST BUS BAY	D	2440	5	SS	TG
70935	KENILWORTH TRAFFIC CIRCLE	WEST BUS BAY	D	2440	5	SS	TG

KITCHENER TRANSIT
MONTHLY OPERATING STATISTICS
FOR MAY 1985

FIG. 20

(1) ROUTE	(2) REVENUE PASSNG.	(3) % CHNG	(4) FARE REVENUE	(5) TOTAL COST	(6) DEFICIT	(7) AVERAGE RIDERSHIP WKDAY	(8) %CHNG	(9) SAT	(10) SUN	(11) REV./COST	(12) DEF./PASSG.	(13) PASS./HOUR	(14) PASS./KM
# 1 QUEEN SOUTH	52,997	-2%	$ 30,527	$ 68,429	($ 37,902)	2,094	0%	1,247	390	0.45	($0.72)	37	1.9
# 2 FOREST HEIGHTS STANLEY PARK	48,641	-6%	$ 28,314	$ 73,914	($ 45,600)	1,956	-6%	1,404	0	0.38	($0.94)	31	1.5
# 3 OTTAWA NORTH OTTAWA SOUTH	44,009	-14%	$ 25,615	$ 72,407	($ 46,792)	1,885	-10%	632	0	0.35	($1.06)	29	1.2
# 4 GLASGOW GUELPH	20,119	-1%	$ 11,719	$ 54,058	($ 42,339)	819	-1%	528	0	0.22	($2.10)	18	1.0
# 5 HALLMAN LANCASTER	12,817	-17%	$ 7,465	$ 31,652	($ 24,187)	550	-15%	180	0	0.24	($1.89)	19	1.0
# 6 BRIDGEPORT FREDERICK	30,869	-7%	$ 17,983	$ 60,215	($ 42,232)	1,259	-8%	794	0	0.30	($1.37)	24	1.3
# 7 MAINLINE	288,145	-4%	$166,926	$251,659	($ 84,733)	11,527	-3%	6,534	1,683	0.66	($0.29)	54	3.2
# 8 LOOP NORTH-SOUTH	131,182	-4%	$ 76,049	$171,797	($ 95,748)	5,174	-5%	3,269	855	0.44	($0.73)	36	1.9
# 9 LAKESHORE LINCOLN	33,589	-7%	$ 19,270	$ 66,643	($ 47,373)	1,417	-8%	604	0	0.29	($1.41)	24	1.2
#10 DOON - PIONEER CHICOPEE	21,976	11%	$ 12,795	$ 67,379	($ 54,581)	905	10%	516	0	0.19	($2.48)	15	0.6
#11 VICTORIA HILLS COUNTRY HILLS	60,993	-1%	$ 35,525	$ 72,804	($ 37,279)	2,494	-1%	1,532	0	0.49	($0.61)	40	2.0
#12 UNIVERSITY FAIRVIEW MALL	25,931	ERR	$ 15,071	$ 59,124	($ 44,053)	1,091	ERR	484	0	0.25	($1.70)	21	0.8
TOTAL	771,268	-1.1%	$447,262	$1,050,081	($602,819)	31,171	-0.5%	17,724	2,928	0.43	($0.78)	35	1.7

NO. OF DAYS IN THE MONTH

	MAY 1985	MAY 1984
WKDY	22	22
SAT	4	4
SUN/HOL	5	5

NO. OF PASSES SOLD IN THE MONTH

MAY 1985	MAY 1984	% CHANGE
3314	3154	5%

NOTES:
*** ROUTE 12 COMMENCED SERVICE SEPTEMBER 4, 1984

(1) ROUTE NUMBER AND NAME
(2) REVENUE PASSENGERS
(3) % CHANGE IN MONTHLY RIDERSHIP FROM LAST YEAR
(4) REVENUE GENERATED FROM FAREBOX AND MONTHLY PASS SALES
(5) SELF EXPLANATORY
(6) SELF EXPLANATORY
(7) AVERAGE WEEKDAY RIDERSHIP
(8) % CHANGE IN AVERAGE WEEKDAY RIDERSHIP FROM LAST YEAR
(9) AVERAGE SATURDAY RIDERSHIP
(10) AVERAGE SUNDAY RIDERSHIP
(11) REVENUE/COST RATIO
(12) DEFICIT PER REVENUE PASSENGER
(13) REVENUE PASSENGERS PER REVENUE HOUR
(14) REVENUE PASSENGERS PER REVENUE KILOMETER

FIG. 21

D.O.I. 06FEB87 1987/1986 BUDGET COMPARISON

	YEARLY 1987 TOTAL	YEARLY 1986 TOTAL	DIFF.	PERCENT CHANGE
HAMILTON TRANSIT AREA:				
ABERDEEN	16,622.78	18,153.84	(1,531.06)	(8.4)
BARTON	87,764.37	87,283.23	481.14	0.6
BAYFRONT	36,731.51	36,712.68	18.83	0.1
BEELINE EXPRESS	11,481.14	3,744.72	7,736.42	206.6
BURLINGTON	12,570.14	12,551.05	19.09	0.2
CANNON	23,518.96	24,490.03	(971.07)	(4.0)
COLLEGE	3,607.97	3,591.84	16.13	0.4
DELAWARE	110,490.59	115,817.58	(5,326.99)	(4.6)
FENNELL	45,996.58	47,366.65	(1,370.07)	(2.9)
GARTH	18,017.55	18,012.85	4.70	0.0
KING	74,249.47	68,171.88	6,077.59	8.9
LIMERIDGE HERITAGE	11,099.24	8,648.54	2,450.70	28.3
LOCKE	14,375.78	15,550.39	(1,174.61)	(7.6)
MOHAWK	23,725.70	24,773.91	(1,048.21)	(4.2)
NASH	15,672.44	15,450.51	221.93	1.4
PARKDALE	25,858.71	26,017.38	(158.67)	(0.6)
SANATORIUM ANCASTER	19,849.67	19,807.95	41.72	0.2
SHERMAN OTTAWA	6,072.00	6,005.16	66.84	1.1
UNIVERSITY ANCASTER	11,878.35	13,954.23	(2,075.88)	(14.9)
UPPER GAGE	28,585.86	28,094.82	491.04	1.7
UPPER JAMES	34,128.95	34,260.07	(131.12)	(0.4)
UPPER KENILWORTH	22,552.49	22,501.71	50.78	0.2
UPPER OTTAWA	24,939.90	26,280.97	(1,341.07)	(5.1)
UPPER PARADISE	13,137.38	12,958.89	178.49	1.4
UPPER SHERMAN	23,656.79	23,914.78	(257.99)	(1.1)
UPPER WELLINGTON	19,324.05	21,017.38	(1,693.33)	(8.1)
UPPER WENTWORTH	21,078.01	19,355.56	1,722.45	8.9
YORK	11,196.62	11,192.93	3.69	0.0
WENTWORTH LOOPS	0.00	3,470.00	(3,470.00)	(100.0)
SUB TOTAL	768,183.01	769,151.53	(968.52)	(0.1)
EXPANSION:				
COLLEGE	1,690.00	1,092.00	598.00	54.8
UPPER GAGE	0.00	1,092.00	(1,092.00)	(100.0)
UPPER PARADISE	1,645.00	1,092.00	553.00	50.6
UPPER SHERMAN	850.00	1,092.00	(242.00)	(22.2)
UPPER WENTWORTH	425.00	1,092.00	(667.00)	(61.1)
SUB TOTAL	4,610.00	5,460.00	(850.00)	(15.6)
SPECIALS:				
CONFEDERATION PARK	736.26	736.26	0.00	0.0
DOWNTOWN SHUTTLE	2,297.81	4,689.00	(2,391.19)	(51.0)
MACCASA LODGE	354.20	0.00	354.20	ERR
ROCK GARDENS	200.55	200.55	0.00	0.0
SUB TOTAL	3,588.82	5,625.81	(2,036.99)	(36.2)
HAMILTON TRANSIT TOTAL	776,381.83	780,237.34	(3,855.51)	(0.5)
ANCASTER TRANSIT AREA:				
SANATORIUM ANCASTER	961.40	981.34	(19.94)	(2.0)
UNIVERSITY ANCASTER	1,464.87	1,466.51	(1.64)	(0.1)
SUB TOTAL	2,426.27	2,447.85	(21.58)	(0.9)
EXPANSION:				
SANATORIUM ANCASTER	382.50	0.00	382.50	ERR
UNIVERSITY ANCASTER	1,105.00	0.00	1,105.00	ERR
SUB TOTAL	1,487.50	0.00	1,487.50	ERR
ANCASTER TOTAL	3,913.77	2,447.85	1,465.92	59.9
BURLINGTON TRANSIT AREA:				
BURLINGTON	3,765.02	3,765.97	(0.95)	(.0)
SUB TOTAL	3,765.02	3,765.97	(0.95)	(.0)
EXPANSION:				
NOT APPLICABLE	0.00	0.00	0.00	ERR
SUB TOTAL	0.00	0.00	0.00	ERR
BURLINGTON TOTAL	3,765.02	3,765.97	(0.95)	(.0)
DUNDAS TRANSIT AREA:				
DELAWARE	8,086.06	8,148.94	(62.88)	(0.8)
DUNDAS LOCAL	1,568.60	1,562.40	6.20	0.4
SUB TOTAL	9,654.66	9,711.34	(56.68)	(0.6)
EXPANSION:				
DELAWARE	382.50	0.00	382.50	ERR
DUNDAS LOCAL	1,105.00	0.00	1,105.00	ERR
SUB TOTAL	1,487.50	0.00	1,487.50	ERR
DUNDAS TOTAL	11,142.16	9,711.34	1,430.82	14.7
STONEY CREEK TRANSIT AREA:				
DELAWARE	1,604.92	1,689.09	(84.17)	(5.0)
KING	6,198.14	12,096.43	(5,898.29)	(48.8)
LIMERIDGE HERITAGE	1,988.98	2,985.22	(996.24)	(33.4)
PARKDALE	222.64	268.11	(45.47)	(17.0)
STONEY CREEK CENTRAL	10,213.00	9,571.87	641.13	6.7
STONEY CREEK LOCAL	5,759.49	5,027.25	732.24	14.6
SUB TOTAL	25,987.17	31,637.97	(5,650.80)	(17.9)
EXPANSION:				
PARKDALE	2,722.50	0.00	2,722.50	ERR
SUB TOTAL	2,722.50	0.00	2,722.50	ERR
STONEY CREEK TOTAL	28,709.67	31,637.97	(2,928.30)	(9.3)
SCHEDULED EXTRAS:				
THURSDAY/FRIDAY ONLY				
THURSDAY ONLY				
SCHOOL				
SCHEDULED EXTRAS TOTAL				
DETOURS:				
CONSTRUCTION	1,200.00	600.00	600.00	100.0
PARADE/EVENTS	700.00	1,400.00	(700.00)	(50.0)
DETOURS TOTAL	1,900.00	2,000.00	(100.00)	(5.0)
SYSTEM GRAND TOTAL	825,812.45	829,800.47	(3,988.02)	(0.5)

FIG. 22

D.O.I. 06FEB87 1987 PLATFORM HOURS BUDGET SUMMARY

	TOTAL SCHEDULED SERVICE			TOTAL SCHEDULED EXTRAS PER ROUTE			YEARLY
	WEEKDAYS	SATURDAY	SUNDAY	THUR/FRI	THUR	SCHOOL	TOTAL
HAMILTON TRANSIT AREA:							
ABERDEEN	12,294.66	1,906.38	2,224.67	0.00	0.00	197.07	16,622.78
BARTON	71,072.76	10,943.58	5,748.03	0.00	0.00	0.00	87,764.37
BAYFRONT	26,995.10	4,453.83	5,232.58	0.00	50.00	0.00	36,731.51
BEELINE EXPRESS	11,481.14	0.00	0.00	0.00	0.00	0.00	11,481.14
BURLINGTON	10,256.62	1,366.80	946.72	0.00	0.00	0.00	12,570.14
CANNON	19,515.16	2,757.57	1,246.23	0.00	0.00	0.00	23,518.96
COLLEGE	3,607.97	0.00	0.00	0.00	0.00	0.00	3,607.97
DELAWARE	85,702.58	13,364.88	9,058.24	0.00	0.00	2,364.89	110,490.59
FENNELL	36,397.20	5,393.25	3,417.83	0.00	0.00	788.30	45,996.58
GARTH	14,211.01	2,624.97	1,181.57	0.00	0.00	0.00	18,017.55
KING	59,955.94	9,367.17	4,926.36	0.00	0.00	0.00	74,249.47
LIMERIDGE HERITAGE	7,372.42	1,311.72	0.00	2,415.10	0.00	0.00	11,099.24
LOCKE	10,772.56	1,695.75	1,907.47	0.00	0.00	0.00	14,375.78
MOHAWK	16,767.91	2,806.02	2,279.57	0.00	0.00	1,872.20	23,725.70
NASH	12,569.04	1,936.47	1,166.93	0.00	0.00	0.00	15,672.44
PARKDALE	20,202.05	2,075.70	2,398.52	0.00	0.00	1,182.44	25,858.71
SANATORIUM ANCASTER	15,326.74	2,172.60	2,350.33	0.00	0.00	0.00	19,849.67
SHERMAN OTTAWA	6,072.00	0.00	0.00	0.00	0.00	0.00	6,072.00
UNIVERSITY ANCASTER	11,878.35	0.00	0.00	0.00	0.00	0.00	11,878.35
UPPER GAGE	21,625.08	3,262.98	2,416.82	0.00	0.00	1,280.98	28,585.86
UPPER JAMES	27,470.74	3,918.33	2,444.27	0.00	0.00	295.61	34,128.95
UPPER KENILWORTH	18,208.41	1,980.33	2,363.75	0.00	0.00	0.00	22,552.49
UPPER OTTAWA	19,587.26	2,684.13	2,372.90	0.00	0.00	295.61	24,939.90
UPPER PARADISE	11,124.41	1,188.30	0.00	824.67	0.00	0.00	13,137.38
UPPER SHERMAN	18,195.76	2,719.32	2,446.10	0.00	0.00	295.61	23,656.79
UPPER WELLINGTON	15,235.66	2,385.27	1,703.12	0.00	0.00	0.00	19,324.05
UPPER WENTWORTH	16,786.55	2,584.68	1,706.78	0.00	0.00	0.00	21,078.01
YORK	8,445.14	1,523.37	1,228.11	0.00	0.00	0.00	11,196.62
WENTWORTH LOOPS	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SUB TOTAL	609,130.22	86,423.40	60,766.90	3,239.76	50.00	8,572.72	768,183.01
EXPANSION:							
COLLEGE	1,690.00	0.00	0.00	0.00	0.00	0.00	1,690.00
UPPER GAGE	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UPPER PARADISE	1,375.00	270.00	0.00	0.00	0.00	0.00	1,645.00
UPPER SHERMAN	850.00	0.00	0.00	0.00	0.00	0.00	850.00
UPPER WENTWORTH	425.00	0.00	0.00	0.00	0.00	0.00	425.00
SUB TOTAL	4,340.00	270.00	0.00	0.00	0.00	0.00	4,610.00
SPECIALS:							
CONFEDERATION PARK	492.66	109.62	133.98	0.00	0.00	0.00	736.26
DOWNTOWN SHUTTLE	1,361.92	523.56	0.00	412.33	0.00	0.00	2,297.81
MACCASA LODGE	354.20	0.00	0.00	0.00	0.00	0.00	354.20
ROCK GARDENS	0.00	0.00	200.55	0.00	0.00	0.00	200.55
SUB TOTAL	2,208.78	633.18	334.53	412.33	0.00	0.00	3,588.82
HAMILTON TRANSIT TOTAL	615,679.00	87,326.58	61,101.43	3,652.10	50.00	8,572.72	776,381.83
ANCASTER TRANSIT AREA:							
SANATORIUM ANCASTER	961.40	0.00	0.00	0.00	0.00	0.00	961.40
UNIVERSITY ANCASTER	1,464.87	0.00	0.00	0.00	0.00	0.00	1,464.87
SUB TOTAL	2,426.27	0.00	0.00	0.00	0.00	0.00	2,426.27
EXPANSION:							
SANATORIUM ANCASTER	382.50	0.00	0.00	0.00	0.00	0.00	382.50
UNIVERSITY ANCASTER	1,105.00	0.00	0.00	0.00	0.00	0.00	1,105.00
SUB TOTAL	1,487.50	0.00	0.00	0.00	0.00	0.00	1,487.50
ANCASTER TOTAL	3,913.77	0.00	0.00	0.00	0.00	0.00	3,913.77
BURLINGTON TRANSIT AREA:							
BURLINGTON	3,081.54	396.78	286.70	0.00	0.00	0.00	3,765.02
SUB TOTAL	3,081.54	396.78	286.70	0.00	0.00	0.00	3,765.02
EXPANSION:							
NOT APPLICABLE	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SUB TOTAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BURLINGTON TOTAL	3,081.54	396.78	286.70	0.00	0.00	0.00	3,765.02
DUNDAS TRANSIT AREA:							
DELAWARE	6,310.29	894.10	881.67	0.00	0.00	0.00	8,086.06
DUNDAS LOCAL	1,568.60	0.00	0.00	0.00	0.00	0.00	1,568.60
SUB TOTAL	7,878.89	894.10	881.67	0.00	0.00	0.00	9,654.66
EXPANSION:							
DELAWARE	382.50	0.00	0.00	0.00	0.00	0.00	382.50
DUNDAS LOCAL	1,105.00	0.00	0.00	0.00	0.00	0.00	1,105.00
SUB TOTAL	1,487.50	0.00	0.00	0.00	0.00	0.00	1,487.50
DUNDAS TOTAL	9,366.39	894.10	881.67	0.00	0.00	0.00	11,142.16
STONEY CREEK TRANSIT AREA:							
DELAWARE	1,236.48	185.58	182.86	0.00	0.00	0.00	1,604.92
KING	4,930.97	683.40	583.77	0.00	0.00	0.00	6,198.14
LIMERIDGE HERITAGE	1,622.88	366.10	0.00	0.00	0.00	0.00	1,988.98
PARKDALE	222.64	0.00	0.00	0.00	0.00	0.00	222.64
STONEY CREEK CENTRAL	7,234.61	1,446.87	0.00	1,531.52	0.00	0.00	10,213.00
STONEY CREEK LOCAL	3,200.45	571.20	0.00	706.86	0.00	1,280.98	5,759.49
SUB TOTAL	18,448.03	3,253.15	766.63	2,238.38	0.00	1,280.98	25,987.17
EXPANSION:							
PARKDALE	2,082.50	640.00	0.00	0.00	0.00	0.00	2,722.50
SUB TOTAL	2,082.50	640.00	0.00	0.00	0.00	0.00	2,722.50
STONEY CREEK TOTAL	20,530.53	3,893.15	766.63	2,238.38	0.00	1,280.98	28,709.67
SCHEDULED EXTRAS:				5,890.48	50.00	9,853.70	
THURSDAY/FRIDAY ONLY	5,890.48	0.00	0.00				
THURSDAY ONLY	50.00	0.00	0.00				
SCHOOL	9,853.70	0.00	0.00				
SCHEDULED EXTRAS TOTAL	15,794.18	0.00	0.00				
DETOURS:							
CONSTRUCTION	1,200.00	0.00	0.00				1,200.00
PARADE/EVENTS	700.00	0.00	0.00				700.00
DETOURS TOTAL	1,900.00	0.00	0.00				1,900.00
SYSTEM GRAND TOTAL	670,265.41	92,510.61	63,036.43				825,812.45

FIG. 23

VOX PROJECT MANAGER - VIEW BY PROJECT

Project	Date			
BUS STOP AND SHELTER STUDY	01/13/86 -	09/15/86		
Action	**Start Date**	**End Date**		
GK,JK DETER. & LIST PROBLEMS	01/13/86	01/17/86	80	N
GK REV BUS AREA POLICY/BYLAWS	01/14/86	01/16/86	99	Y
JK,GK REV INSTAL BY CITY TRAF	01/17/86	01/24/86	80	N
GK REV APTA '83 STOPS STUDY	01/20/86	01/21/86	99	Y
GK REV TTC,CUTA, RTAC CRITER.	01/22/86	01/23/86	99	Y
GK REV EXIST. SHEL SITE PLANS	01/24/86	01/31/86	99	Y
GK PREP SAMPLE DIAG. ST. FURN	02/03/86	02/11/86	75	N
GK,JK DEV ALTERN SIGN OPTIONS	02/12/86	02/24/86	99	Y
JK DETER IMPACT AREA VS STOP	02/24/86	03/03/86	50	N
GK PREP DISCUS PAPER ON CRITE	02/25/86	03/10/86	90	N
LC MODIFY KIT. TRANSIT PRGRM	03/06/86	04/04/86	50	N
GK,JK SLIDES OF PROBLEM STOPS	03/10/86	03/18/86	99	Y
GK DEV FIELD INVENTORY SHEET	03/11/86	03/14/86	99	Y
GK JK SLIDES-NEW STOPS ON-ST.	03/17/86	03/21/86	99	Y
VM OBTAIN VEHICLE-FIELD WORK	03/18/86	03/26/86	50	N
GK CALC CITY TRAF INSTAL COST	03/21/86	03/31/86	50	N
JK,GK APPLY CRIT TO PROB STPS	03/24/86	04/30/86	00	N
VM PRESENTATION TO MGMT	03/31/86	03/31/86	00	N
GK,JK INPUT FROM OTHER DEPTS	03/31/86	04/15/86	00	N
VM APPROVAL FROM SR. MGMT .	03/31/86	04/01/86	00	N
CO-OP COLLECT DATA (PHOTOS)	04/01/86	07/25/86	00	N
GK ASSGN 5-DIGIT UNIQUE STP #	04/01/86	04/15/86	80	N
CK INPUT DATA INTO COMPUTER	04/07/86	07/31/86	00	N
CK VERIFY FIELD SHEETS	04/07/86	07/25/86	00	N
GK VERIFY DATA INPUT	04/07/86	07/31/86	00	N
JK,GK PROB WITH STANDARDIZA.	04/21/86	05/05/86	00	N
GK MODIFY PRELIM CRITERIA	05/12/86	05/26/86	00	N
GK DEV TECH & POLICY MANUAL	05/27/86	06/16/86	00	N
VM APPRVL GUIDELINES SR. MGMT	06/19/86	06/19/86	00	N
GK LIST OF ALL BUS STOP LOCNS	08/05/86	08/05/86	00	N
GK LIST OF STOPS WITH NO PADS	08/05/86	08/05/86	00	N
GK LIST OF VANDALIZED STOPS	08/05/86	08/05/86	00	N
GK DETER PRIORITIES FOR IMPL	08/06/86	08/11/86	00	N
GK EST COSTS OF EACH PRIORITY	08/12/86	08/18/86	00	N
VM REV COSTS WITH SR. MGMT.	08/20/86	08/27/86	00	N
VM,GK DEV ANNUAL PGRM & BUDGT	08/28/86	09/05/86	00	N
VM REV ANNUAL PRGM SR. MGMT.	09/05/86	09/05/86	00	N
VM COUNCIL APPRVL GUIDELINES	09/08/86	09/08/86	00	N
VM COUNCIL APPRVL ANNUAL PRGM	09/08/86	09/08/86	00	N
GK,JK APP APPR CRIT TO PROBL	09/09/86	09/15/86	00	N
VM APPRVLS FOR BY-LAW CHANGES	09/15/86	09/15/86	00	N

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                                12-JAN 19-JAN 26-JAN 02-FEB 09-FEB 16-FEB 23-FEB 02-MAR 09-MAR 16-MAR 23-MAR 30-MAR 06-APR 13-APR
                                !      !      !      !      !      !      !      !      !      !      !      !      !      !
Action                          SMTWTFSSMTWTFSSMTWTFSSMTWTFSSMTWTFSSMTWTFSSMTWTFSSMTWTFSSMTWTFSSMTWTFSSMTWTFSSMTWTFSSMTWTFSSMTWTFS
--------------------------------+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
GK,JK DETER. & LIST PROBLEMS     *****
GK REV BUS AREA POLICY/BYLAWS     ***
JK,GK REV INSTAL BY CITY TRAF        ********
GK REV APTA '83 STOPS STUDY             **
GK REV TTC,CUTA, RTAC CRITER.             **
GK REV EXIST. SHEL SITE PLANS               ********
GK PREP SAMPLE DIAG. ST. FURN                        *********
GK,JK DEV ALTERN SIGN OPTIONS                                 *************
JK DETER IMPACT AREA VS STOP                                             ********
GK PREP DISCUS PAPER ON CRITE                                             **************
LC MODIFY KIT. TRANSIT PRGRM                                                      ******************************
GK,JK SLIDES OF PROBLEM STOPS                                                         *********
GK DEV FIELD INVENTORY SHEET                                                           ****
GK JK SLIDES-NEW STOPS ON-ST.                                                               *****
VM OBTAIN VEHICLE-FIELD WORK                                                                 *********
GK CALC CITY TRAF INSTAL COST                                                                   ***********
JK,GK APPLY CRIT TO PROB STPS                                                                      ****************************
VM PRESENTATION TO MGMT                                                                                   *
GK,JK INPUT FROM OTHER DEPTS                                                                              ****************
VM APPROVAL FROM SR. MGMT .                                                                               **
CO-OP COLLECT DATA (PHOTOS)                                                                                ******************
GK ASSGN 5-DIGIT UNIQUE STP #                                                                              ***************
CK INPUT DATA INTO COMPUTER                                                                                      *************
CK VERIFY FIELD SHEETS                                                                                           *************
GK VERIFY DATA INPUT                                                                                             *************
JK,GK PROB WITH STANDARDIZA.                                                                                                  *
GK MODIFY PRELIM CRITERIA                                                                                                     *
GK DEV TECH & POLICY MANUAL                                                                                                   *
VM APPRVL GUIDELINES SR. MGMT                                                                                                 *
GK LIST OF ALL BUS STOP LOCNS                                                                                                 *
GK LIST OF STOPS WITH NO PADS                                                                                                 *
GK LIST OF VANDALIZED STOPS                                                                                                   *
GK DETER PRIORITIES FOR IMPL                                                                                                  *
GK EST COSTS OF EACH PRIORITY                                                                                                 *
VM REV COSTS WITH SR. MGMT.                                                                                                   *
VM,GK DEV ANNUAL PGRM & BUDGT                                                                                                 *
VM REV ANNUAL PRGM SR. MGMT.                                                                                                  *
VM COUNCIL APPRVL GUIDELINES                                                                                                  *
VM COUNCIL APPRVL ANNUAL PRGM                                                                                                 *
GK,JK APP APPR CRIT TO PROBL                                                                                                  *
VM APPRVLS FOR BY-LAW CHANGES                                                                                                 *
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FIG. 24

DOWNTOWN REVITAL./TRANSIT MALL STUDY FOR : PROJECT COMMITTEE EARLY START/FINISH DISPLAY SEC- 1

DOWNTOWN REVITAL./TRANSIT MALL STUDY FOR : PROJECT COMMITTEE EARLY START/FINISH DISPLAY SEC- 2

DOWNTOWN REVITAL./TRANSIT MALL STUDY FOR : PROJECT COMMITTEE EARLY START/FINISH DISPLAY SE

04/10/84 ACTIVITY-ON-ARROW DIAGRAM
KITCHENER TRANSIT
V. C. MAUCERI
****** CRITICAL ++++++ IN PROCESS
****** COMPLETED ------ NON CRITICAL

2 16-0 22/05 23/05/84
[1]-------(1 TO 10)
COMMENCE PROJECT

0 16-0 24/05 24/05/84
(10)-------(10 TO 20)
LINKAGE ONLY

0 38-0 24/05 24/05/84
[20]-------(20 TO 30)
LINKAGE ONLY

22 16-0 24/05 25/06/84
----------(20 TO 80)
CONDUCT TRANSIT O-D SURVEY OF DOWNTOWN PASSENGERS

2 98-0 24/05 25/05/84
----------(10 TO 100)
LIST EXISTING AMENITIES FOR DRIVERS & PUBLIC

2 98-0 29/05 30/05/84
----------(100 TO 150)
DETERM. AMENITIES FOR PASS. & OPERATORS

0 105-0 24/05 24/05/84
----------(10 TO 352)
LINKAGE ONLY

0 99-0 29/05 29/05/84
[100]-------(100 TO 110)
LINKAGE ONLY

5 105-0 24/05 31/05/84
[352]-------(352 TO 354)
CONDUCT LIT. SEARCH ON PAST STUDIES

0 118-0 24/05 24/05/84
----------(352 TO 460)
LINKAGE ONLY

0 43-0 24/05 24/05/84
[30]-------(30 TO 40)
LINKAGE ONLY

10 38-0 24/05 07/06/84
----------(30 TO 70)
MEASURE PASSENGER TRANSFER AND ON/OFF FLOW IN CBD

0 21-0 26/06 26/06/84
[80]-------(80 TO 90)
LINKAGE ONLY

1 25-0 26/06 26/06/84
----------(80 TO 130)
OBTAIN DESCRIP. STATS SOFTWARE

10 16-0 26/06 10/07/84
----------(80 TO 140)
IMPACT OF STOP LOC. ON RIDERSHIP

1 99-1 29/05 29/05/84
[110]-------(110 TO 160)
DETER. LOC. & NO. OF VIDEO DISPLAY TERMINALS

0 98-0 31/05 31/05/84
[150]-------(150 TO 160)
LINKAGE ONLY

3 105-0 01/06 05/06/84
[354]-------(354 TO 356)
EXAMINE OTHER TRANSIT PROF S TRANSFER POLICIES

0 118-0 24/05 24/05/84
[460]-------(460 TO 470)
LINKAGE ONLY

2 121-0 24/05 25/05/84
----------(460 TO 520)
REV. MTC SUBSIDY PROGRAMS

3 45-2 24/05 25/05/84
(40 TO 60)
DEVELOP ALTERN. ROUTE STRATEGIES

5 43-0 24/05 31/05/84
[40]-------(40 TO 50)
IDENTIFY FUTURE POTENTIAL ARTIC ROUTES

0 38-0 08/06 08/06/84
[70]-------(70 TO 120)
LINKAGE ONLY

5 21-5 26/06 02/07/84
[90]-------(90 TO 140)
EVALUATE EXISTING CBD USERS

0 25-9 27/06 27/06/84
[130]-------(130 TO 140)
LINKAGE ONLY

1 98-0 31/05 31/05/84
[160]-------(160 TO 210)
DETER CAPACITY OF PEDESTRIAN & TRANSIT SHELTERED AREAS

0 105-73 06/06 06/06/84
(356)-------(356 TO 360)
LINKAGE ONLY

0 118-0 24/05 24/05/84
[470]-------(470 TO 480)
LINKAGE ONLY

2 121-0 24/05 25/05/84
----------(470 TO 530)
REV. FEDERAL SUBSIDY PROGRAMS

0 121-0 29/05 29/05/84
[520]-------(520 TO 530)
LINKAGE ONLY

0 43-0 01/06 01/06/84
[50]-------(50 TO 60)
LINKAGE ONLY

2 98-0 01/06 04/06/84
[210]-------(210 TO 250)
DETER SEATING REQMTS FOR WAITING PASS.

0 118-0 24/05 24/05/84
[480]-------(480 TO 490)
LINKAGE ONLY

4 119-0 24/05 30/05/84
----------(480 TO 540)
INPUT TASKS INTO CPM PROGRAM

0 121-2 29/05 29/05/84
[530]-------(530 TO 540)
LINKAGE ONLY

0 43-5 01/06 01/06/84
[60]-------(60 TO 120)
LINKAGE ONLY

6 98-0 05/06 12/06/84
[250]-------(250 TO 290)
PROVIDE UNIT COSTS FOR PEDEST. ENCLOSURES & CANOPIES

4 119-0 24/05 30/05/84
[490]-------(490 TO 495)
DETER. PUBLIC INPUT PROGRAM

0 118-0 24/05 24/05/84
----------(490 TO 500)
LINKAGE ONLY

0 38-22 08/06 08/06/84
[120]-------(120 TO 140)
LINKAGE ONLY

2 98-0 13/06 14/06/84
[290]-------(290 TO 330)
IDENTIFY HEATING/COOLING OPTIONS FOR WAITING AREAS

0 119-0 31/05 31/05/84
[495]-------(495 TO 540)
LINKAGE ONLY

20 118-102 24/05 21/06/84
[500]-------(500 TO 610)
PARTICIPATE IN MEETINGS & PRESENTATIONS

10 16-0 11/07 24
----------(140 TO 1
PREPARE CONCEPT

10 16-0 11/07 24
[140]-------(140 TO 1
PREP. ALTERN. TE DRWGS.

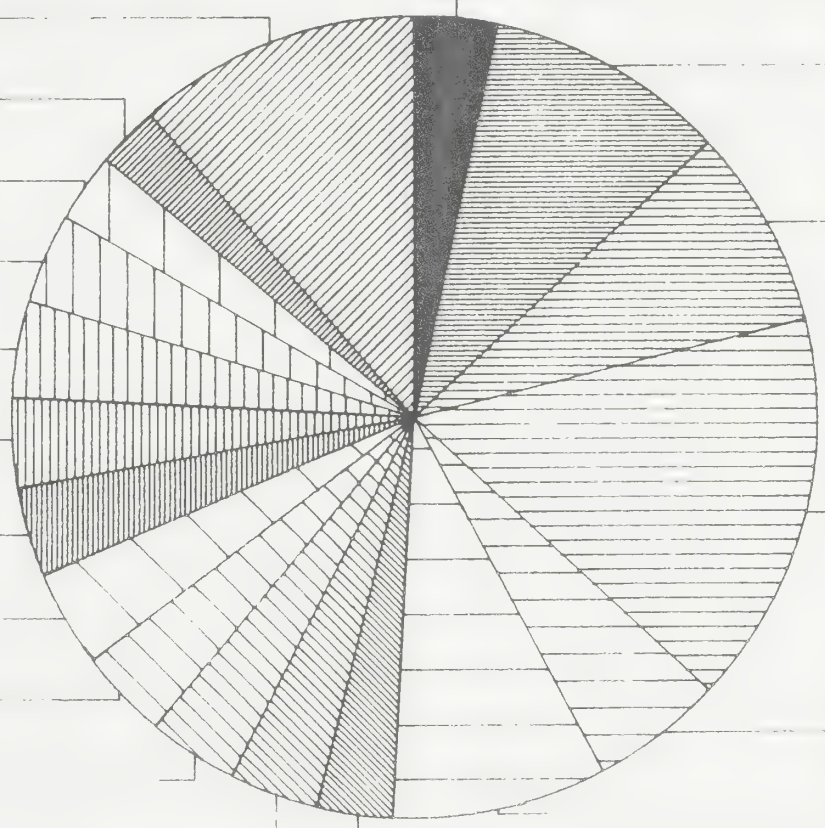
0 98-66 15/06 1
[330]-------(330 TO
LINKAGE ONLY

0 119-103 31/05
[540]-------(540 TO
LINKAGE ONLY

FIG. 25

FIG. 26

TOTAL PLATFORM HOURS BY ROUTE



HOURS AND MILES BY ROUTE

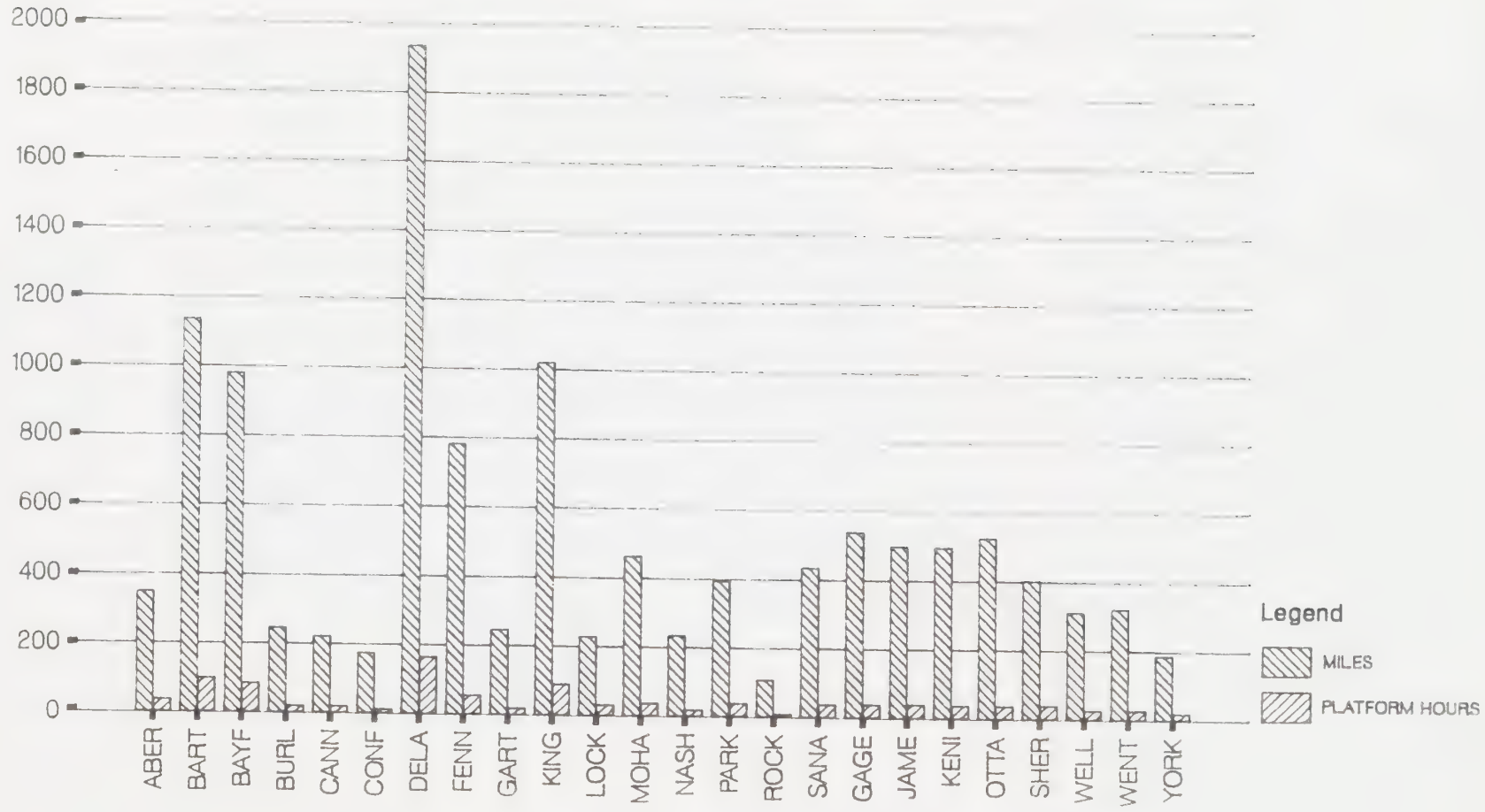
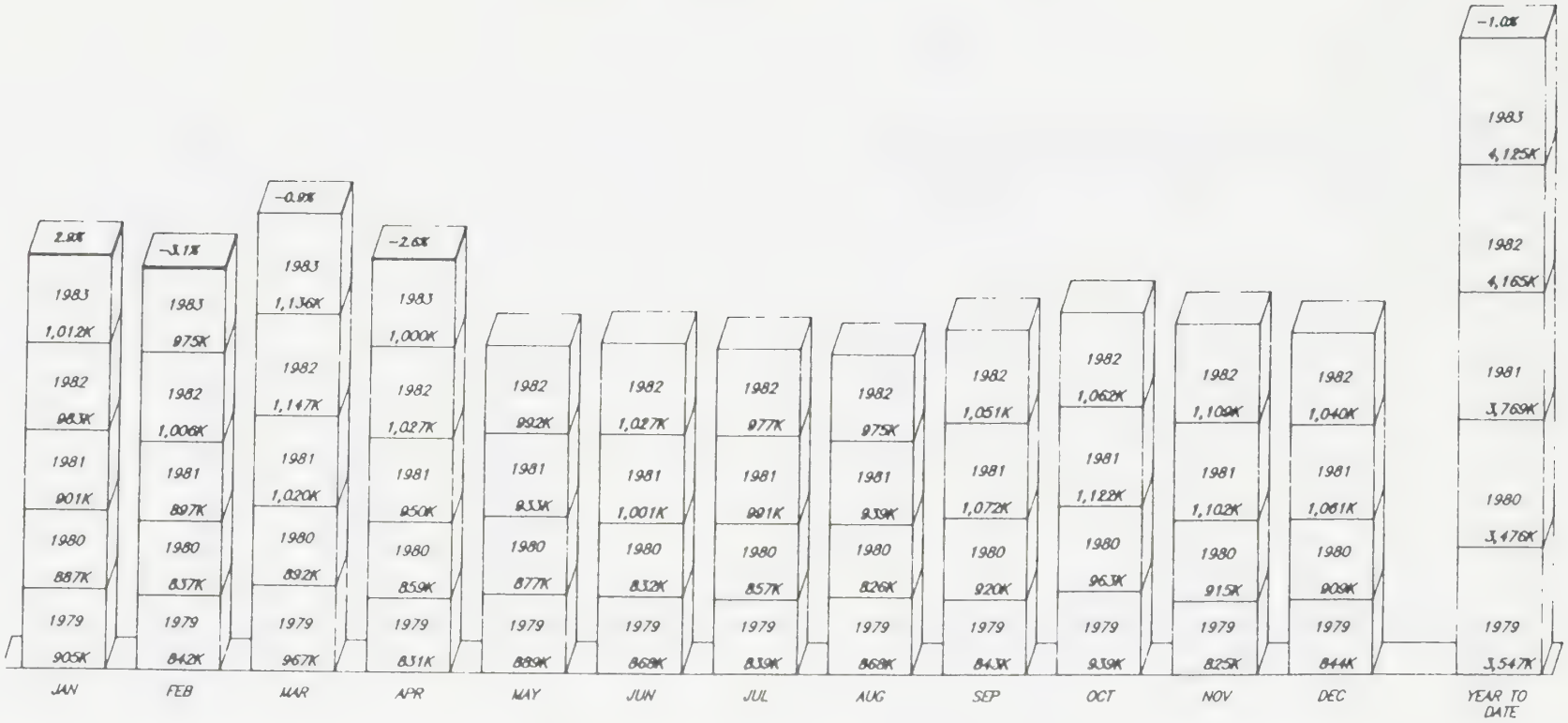


FIG. 27

MISSISSAUGA TRANSIT

MONTHLY RIDERSHIP FROM 1979 TO 1983



LEGEND

K = 1,000

RIDERSHIP FOR 1979 TO 1983 → INCREASED OVER 1982

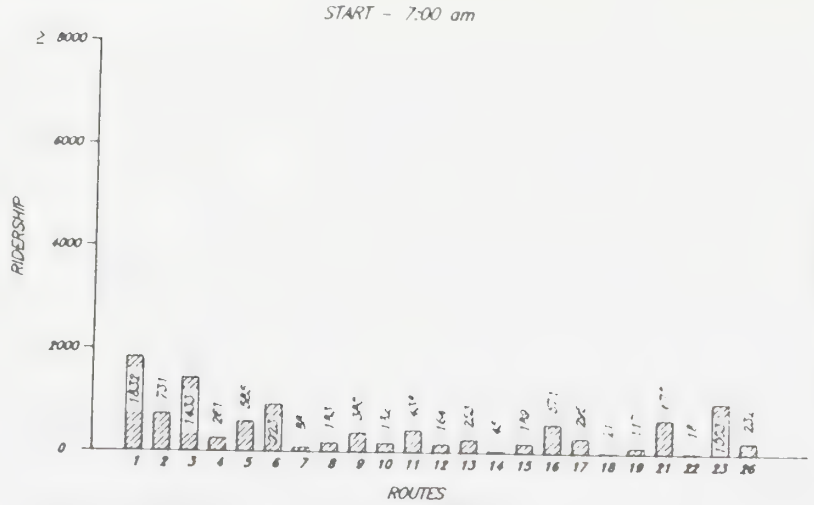
RIDERSHIP FOR 1979 TO 1983 → DECREASED OVER 1982

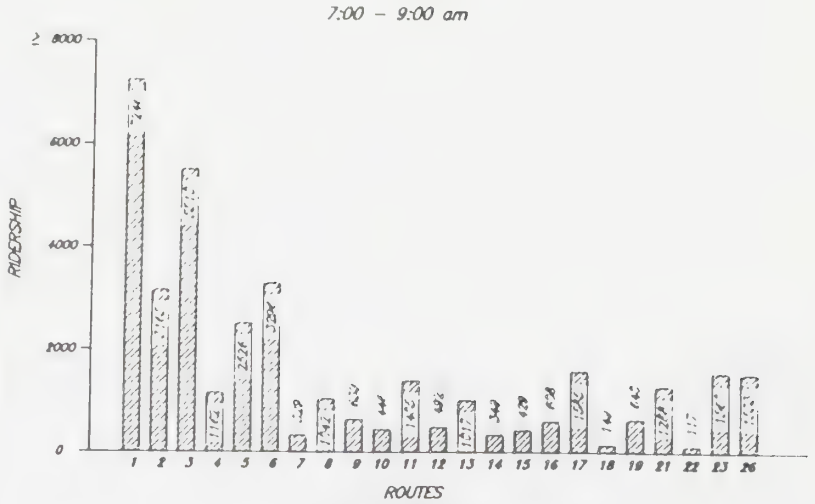
MAY 4, 83

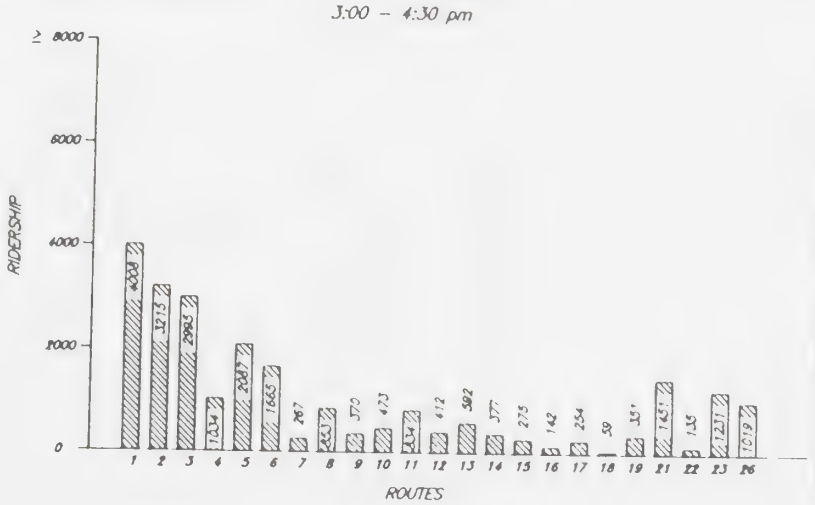
FIG. 28

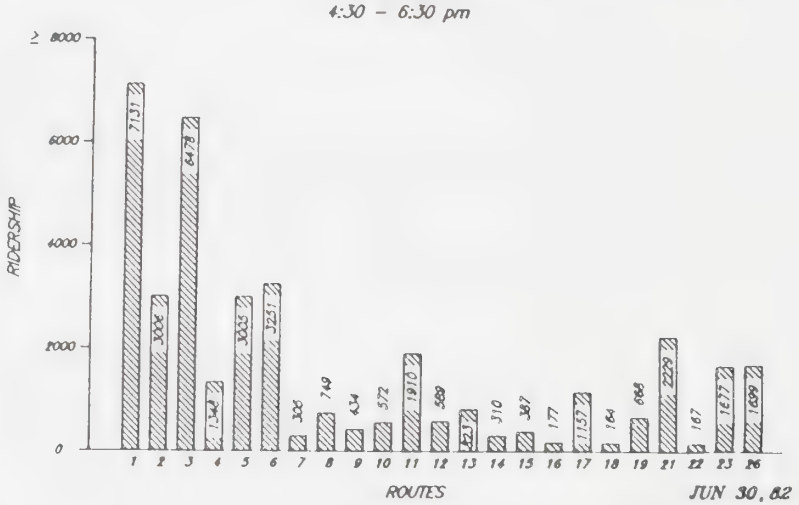
MISSISSAUGA TRANSIT

WEEKDAY AM/PM PEAK RIDERSHIP SPREAD REPORT FROM 24-MAY-82 TO 28-MAY-82









JUN 30, 82

FIG. 29

FIG. 30

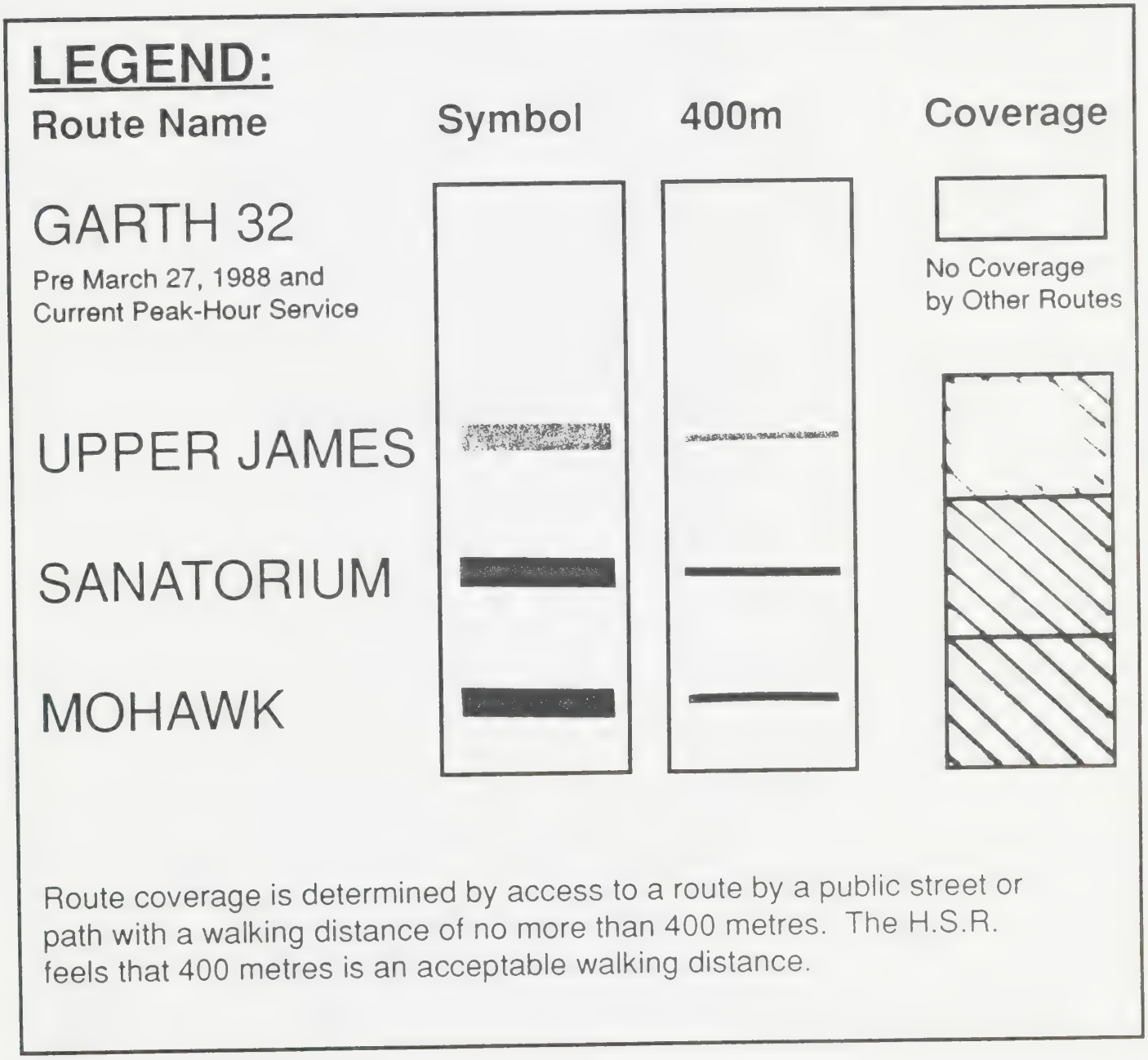

LEGEND:
Route Name
Symbol
400m
Coverage
GARTH 32
Pre March 27, 1988 and
Current Peak-Hour Service
No Coverage
by Other Routes
UPPER JAMES
SANATORIUM
MOHAWK
Route coverage is determined by access to a route by a public street or path with a walking distance of no more than 400 metres. The H.S.R. feels that 400 metres is an acceptable walking distance.

FIG. 31

NEW ANCASTER SERVICES
EFFECTIVE MAY 2, 1988

ROUTE 16 - ANCASTER

NORTHBOUND			SOUTHBOUND		
McMaster University	Wilson & Church	Anson & Hwy. # 53	Anson & Hwy. # 53	Wilson & Church	McMaster University
Leave	Arrive	Arrive	Leave	Arrive	Arrive
AM					
6:20	6:34	6:46	6:51	7:04	7:18
6:50	7:04	7:16	7:21	7:34	7:48
7:20	7:34	7:46	7:51	8:04	8:18
7:50	8:04	8:16	8:21	8:34	8:48
8:20	8:34	8:46	8:51	9:04	9:18
8:50	9:04	9:16	9:21	9:34	9:48
PM					
3:10	3:24	3:37	3:42	3:54	4:08
3:40	3:54	4:07	4:12	4:24	4:38
4:10	4:24	4:37	4:42	4:54	5:08
4:40	4:54	5:07	5:12	5:24	5:38
5:10	5:24	5:37	5:42	5:54	6:08
5:40	5:54	6:07	6:12	6:24	6:38
6:10	6:24	6:37	6:38	6:50	7:04

ROUTE 17 - ANCASTER LOCAL

WESTBOUND			EASTBOUND		
Redeemer College	Wilson & Church	Ancaster High Sch.	Ancaster High Sch.	Wilson & Church	Redeemer College
Leave	Arrive	Arrive	Leave	Arrive	Arrive
AM					
—	—	—	6:52	7:04	7:17
6:51	7:04	7:16	7:22	7:34	7:47
7:21	7:34	7:46	7:52	8:04	8:17
7:51	8:04	8:16	8:22	8:34	8:47
8:21	8:34	8:46	8:52	9:04	9:17
8:51	9:04	9:16	—	—	—
PM					
—	—	—	—	3:26	3:39
3:11	3:24	3:36	3:42	3:54	4:07
3:41	3:54	4:06	4:12	4:24	4:37
4:11	4:24	4:36	4:42	4:54	5:07
4:41	4:54	5:06	5:12	5:24	5:37
5:11	5:24	5:36	5:42	5:54	6:07
5:41	5:54	6:06	6:12	6:24	6:37
6:11	6:24	6:36	—	—	—

THE HAMILTON STREET RAILWAY COMPANY

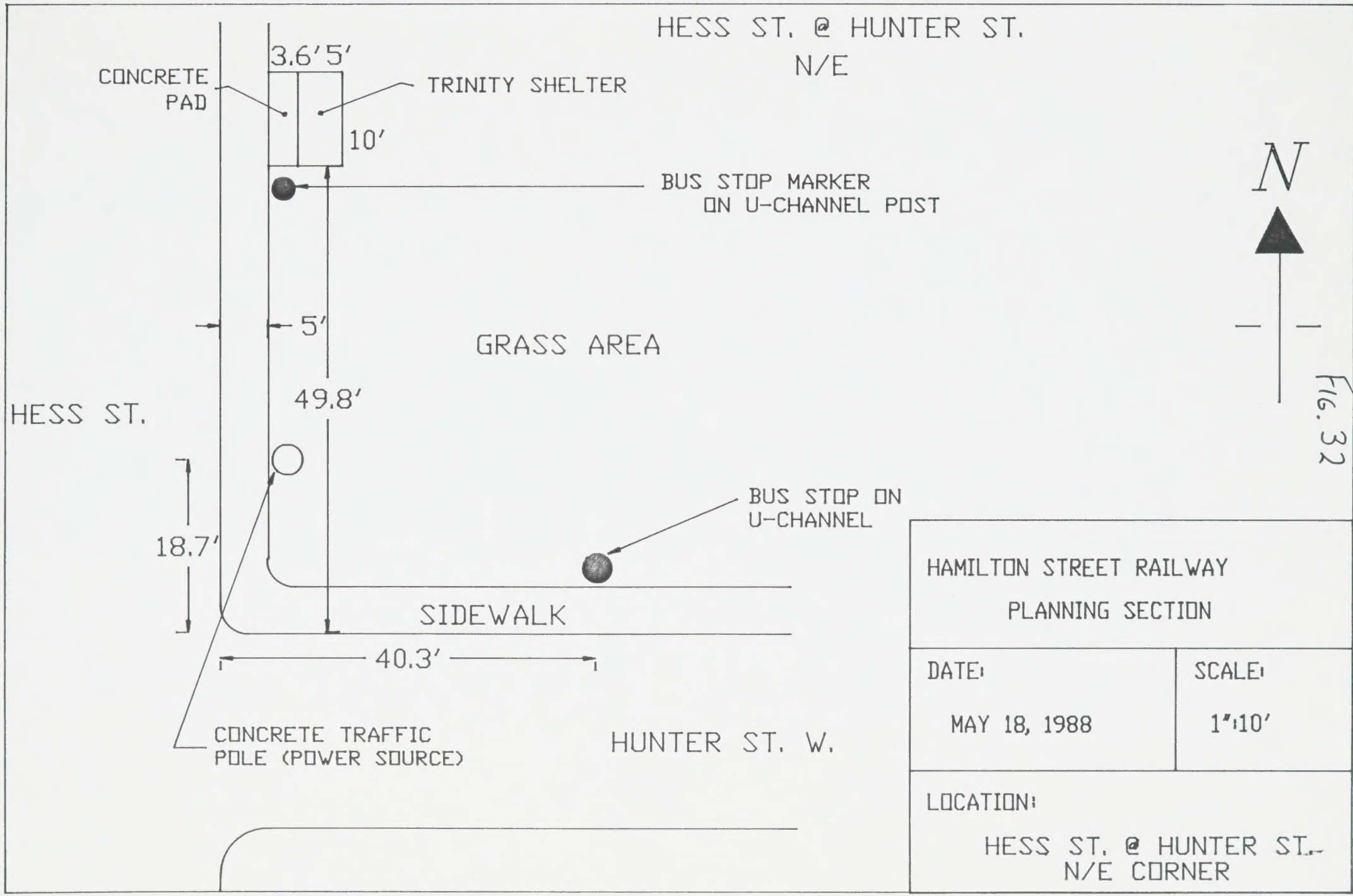

HESS ST. @ HUNTER ST.
N/E
3.6'
5'
CONCRETE PAD
TRINITY SHELTER
10'
BUS STOP MARKER ON U-CHANNEL POST
N
5'
GRASS AREA
HESS ST.
49.8'
18.7'
BUS STOP ON U-CHANNEL
SIDEWALK
40.3'
CONCRETE TRAFFIC POLE (POWER SOURCE)
HUNTER ST. W.
HAMILTON STREET RAILWAY
PLANNING SECTION
DATE:
MAY 18, 1988
SCALE:
1":10'
LOCATION:
HESS ST. @ HUNTER ST.
N/E CORNER

FIG. 32

HAMILTON PUBLIC LIBRARY
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Hilroy
1958